

# Tree Planting in Prince George's County, Maryland: Case Studies and Benefits Assessment in Four Parks





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## Green Infrastructure and Community Greening

Fall 2019

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# Acknowledgments

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# Executive Summary

The benefits of trees and forests and the ecosystems services that they provide is well documented. Ecosystems services include carbon sequestration, stormwater retention, water pollution reduction, air pollution retention and others. In addition, tree planting efforts provide numerous social benefits including improvement of community cohesion, increase in social capital, and environmental stewardship and education.

In order to provide a greater understanding of tree planting efforts and assessing tree benefits locally, two major project components were undertaken: 1) the research and documentation using case studies of individual tree planting efforts, and 2) assessment of benefits of recent and proposed trees for four selected parks in Prince George's county.

## Case Studies

Tree planting efforts are growing in number and complexity throughout the nation and in the world. While the case studies reflected here only represent information that was obtained for the web, the selected case studies reflect a variety of issues from organization type, benefits, process, funding and other factors. These factors may be useful to assist in making any tree planting effort better. There is a range of organizations from small nonprofits to complex governmental programs. Some of the programs reflect a focus on increasing tree and canopy while others focus on building environmental stewardship and community capacity. Trees planted range from large standards to small container plants. The documentation of both the process and the completed work also varies substantially among the reviewed case studies. It is clear that this documentation is very important to demonstrate the wise use of resources and measure the success of tree plantings or community building. In summary, documentation of process and benefits of tree plantings is important to their success and ongoing operation.

## Assessment of Benefits of Recent and Proposed Trees for Four Selected Parks in Prince George's County, MD

Student teams investigated four parks of similar size. Tree planting lists were provided by Prince George's County Parks and Recreation and assumptions were made based on the available information and web review. An I-Tree analysis suggests that recent plantings, have contributed a range of 26 to 218 pounds of sequestered carbon in the current year. Over the next 25 five years, the estimated sequestered carbon of the recent plantings ranges from 3,194 to 76,170 pounds. In addition, the overall benefits of recent plantings range from \$3 to \$16 while over the next 25 years, the overall benefits range from \$418 to \$10,024.

Student teams also proposed additional trees for each of the four parks. An I-Tree analysis suggests that proposed plantings, would contribute a range of 385 to 674 pounds of sequestered carbon in the current year. Over the next 25 five years, the estimated sequestered carbon of the proposed planting ranges from 81,501 to 203,094 pounds. In addition, the overall benefits of proposed plantings range from \$30 to \$67 while over the next 25 years, the overall benefits range from \$11,063 to \$27,081.

# Methods

The work documented in this study was undertaken to satisfy the project component of LARC 452 Green Infrastructure and Community Greening. To provide a greater understanding of tree planting efforts and assessing tree benefits, two major components were undertaken:

1. research and documentation using case studies of individual tree planting efforts, and
2. assessment of benefits of recent and proposed trees for four selected parks in Prince George's county.

## Case Studies

The following steps were undertaken:

1. students selected a case study of a tree planting effort or program from a web search
2. a preliminary report was made using a standard format and presented in class
3. a discussion following the presentation explored similar ways to characterize the selected case studies
4. final case study document was developed
5. the case studies were briefly presented and a reflection was included in the presentation process.

## Benefits Assessment of Recent and Proposed Trees For Four Selected Parks In Prince George's County

The following steps were undertaken:

1. Data from the parks was reviewed to determine approach of assessment of recent planting
2. On-site field trip for pilot
3. Four parks were selected for assessment. For each park, team leaders were selected for the production of four boards:
  - a. Inventory Base Map Board Leader
  - b. Photographic Board Leader
  - c. Design Board Leader, and
  - d. Benefits Board Leader(s)
4. Students were required to visit their assigned parks. After visiting, each student submitted an independent inventory description of the park and uploaded photographs to a cloud folder
5. All inventory description were sent to the Inventory Base Map Board Leaders and photographs were provided to the Photographic Board Leader
6. To achieve a level of individual familiarity with "I-Tree" design and to prepare students for a design charrettes, students completed individual assignments an I-Tree exercise for the park that was submitted online.

*For this portion of the project, students used a website to add ten (10) trees to their chosen park. They chose at least five (5) different species of trees, three (3) being canopy trees, and two (2) being understory trees. They added at least ten (10) trees to their park. The placement of these trees was thoughtful with decisions in part based but not limited to the criteria provided in the assignment.*

7. A design charrette, utilizing professional support, was undertaken that resulted in
  - a. discussion of park sites
  - b. ideation of design goals
  - c. graphic planting design
8. Four boards were created for each of the four parks and presented for an interim review with the following content:
  - a. Inventory Base Map Board
    - i. map of park
    - ii. written description of characteristics of the park
  - b. Photographic Board
    - i. map of park
    - ii. typical photos of the vegetation and features of the park
  - c. Design Board
    - i. design goals
    - ii. a proposed graphic master plan
    - iii. preliminary tree list
  - d. Benefits Board
    - i. carbon sequestration of previous planted trees and proposed planted trees
9. The final tree list was sent by the Design Board Leader to the Benefits Board Leader(s) for calculation of benefits for recent planting and proposed tree plantings.

## Summary

Both the case studies and benefits assessment were presented and contribute to a better understanding of the breadth and diversity of tree planting efforts. Together, these two component contribute to a better understanding of the diversity and breadth of tree planting efforts. In addition, they provide tangible examples of how tree planting opportunities in Prince George's County Parks can contribute to ecosystem services afforded by trees.



# Tree Planting Case Studies

## Tree Planting

## Case Studies

## Case Studies

# 5 Million Trees

New South Wales, Australia

## Introduction

This program encourages an increase of tree canopy in the urban areas of Sydney, particularly in the newly developed parts to the city's west. A main element is the website which provides people with a tree guide for determining what would grow best in a specific area. Property owners are encouraged to seek professional advice and once planted, their trees can be registered. The purpose of registration is to keep track of the number of trees planted and progress towards the final goal.



Figure 1- the Logo used for marketing the goal (NSWGOV 2019)

## Goals

The Sydney tree initiative seeks to plant five million trees by 2030, and aims for the area to achieve 50% tree cover. While some regions are currently fulfilling a larger canopy cover, NSW aims for all regions to be close to a 50% cover. Below are the overarching goals listed on their website:

- Enhance the tree canopy of Greater Sydney, particularly in suburbs with the least amount of tree cover.

- Promote the establishment of newly planted trees to ensure longevity of the tree canopy.
- Promote partnership projects between state and local governments.
- Support projects that demonstrate a commitment to canopy expansion, including improved outcomes for health, sustainability and climate adaptation.

## Stakeholders

The program is aimed at various community members. Homeowners are encouraged to plant on their private property. Community groups and councils are urged to improve livability and the environment in shared spaces, particularly at schools, parks and streets. Areas where more canopy cover is to be improved are emphasized; schools, local parks and street trees. It appears that this initiative applies to most groups, i.e. students, businesses and the local government.

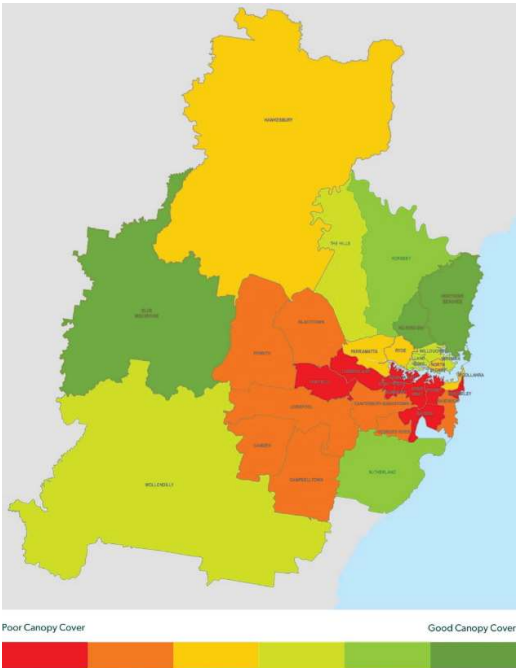


Figure 2- Map of Sydney regions and their % canopy cover (NSWGOV 2019)

## Funding

Financing mostly applies at a group level and is currently distributed to local governments to disperse. As of 2019, 32 community groups in 20 councils have received funds directed at tree planting. The government has set aside over 5 million dollars towards this cause.

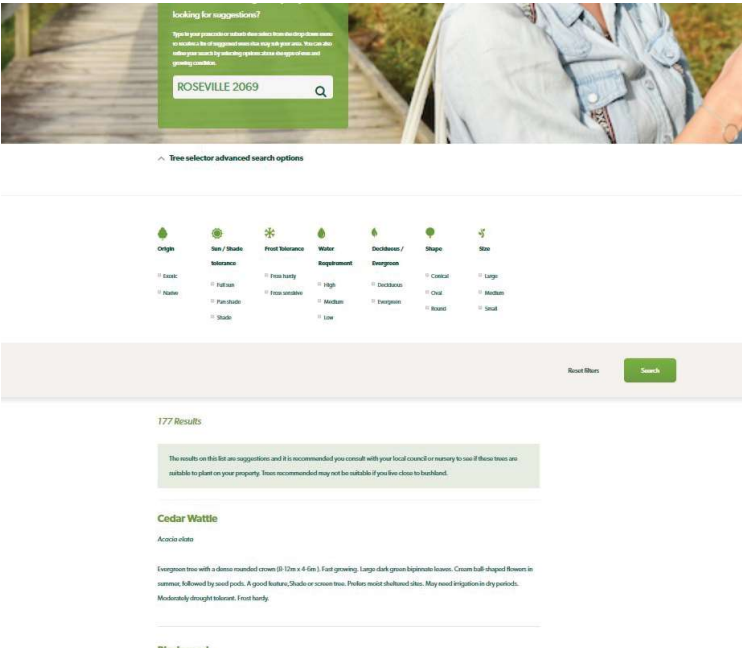


Figure 3- s the searching tool available which matches your location and preferences with specific tree species.

## Sources

Five million trees for a greener Sydney by 2030 | 5 Million Trees for Greater Sydney. (2019). Retrieved 24 November 2019, from <https://5milliontrees.nsw.gov.au/>



# Tree San Diego

San Diego, California, USA

## Introduction

The Tree San Diego (TSD) organization works to reverse the loss of forest in the region. They support reforestation as well as mapping and tree benefit assessment projects. TSD also addresses trees that are cut down, pursuing their re-use and limiting burning that can release harmful greenhouse gases. Much of their work is completed through the contribution of local volunteers and community involvement.



Figure 1: Tree San Diego Logo

## Goals

The overall all goal is to improve the San Diego area's environmental and community health through the improving of the quality and quantity of trees. Quality refers the individual and communal health of tree species, proper native species, and the proper maintenance of the trees. Quantity relates to the organization's mission to increase the overall tree canopy cover for the region. Tree San Diego refers to trees as "one of the best investments we can make in the future of our city." Urban forestry provides both aesthetic and health services such as providing cleaner air and increasing local property value.

When properly planted and cared for, they can even be beneficial when it comes to storm water management. Other benefits of their tree planting and maintenance includes carbon removal, soil conservation, and wildlife habitat

## Stakeholders

With the cooperation of local governments, large volunteer pools can be tapped. Prominent partners include the California Departmet of Forestry and Fire Protection, California ReLEAF, SDGE Utility, California Urban Forests Council, and Urban Corps of San Diego.

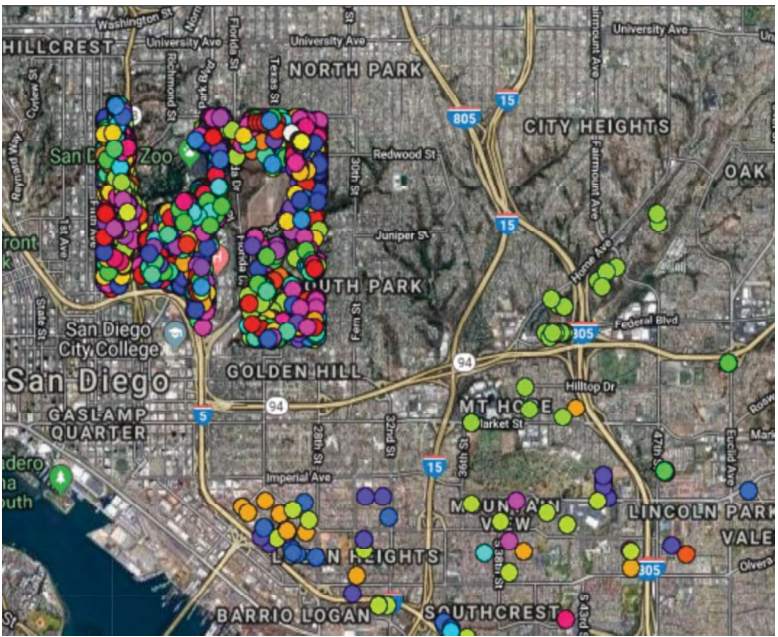


Figure 2: Here you can the locations of numerous trees that have been planted by the organization around the San Diego area

## Other

One project from 2015 to 2019 is the Tree Advantage Project with the collaboration of the California Department of Forestry and Fire Protection as well as the Urban Corps of San Diego. The goal of this project is to add tree canopy in public spaces that have been identified as "disadvantaged" to provide ongoing human and environmental benefits. Another project, the Terrific Trees Education Workshop, focused on education the public and local students on the benefits of healthy trees in communities with the help of SDGE. The Trējuvenation Project, with the help of both the California Department of Forestry and Fire Protection and California Climate Investments, focuses on using downed trees in a more economic and environmentally friendly ways such as lumber and furniture. Not only does this transition away from wasteful uses, it also provides jobs for the local community.



Figure 3: Local students volunteer in the planting of trees, here seen water the newly planted native tree species

## Sources

Tree San Diego. (n.d.). Retrieved November 22, 2019, from <http://www.treesandiego.org/>.



# USDA Conservation

Maryland's Eastern Shore, USA

## Introduction

Duvall Farm, on Easton's Trippe Creek is a model of balancing farm operations and conservation. Farms and large-lot owners can use the U.S. Department of Agriculture's (USDA) conservation programs to create a more diversified model of land management that improves local water quality and results in aesthetically pleasing landscapes supportive of Eastern Shore waterfowl populations and wildlife.



Figure 1 - Image of marsh land

## Goals

Owners Chip and Sally Akridge's vision for the farm is to create and restore wildlife habitat and improve water quality, while maintaining productive agricultural lands. Through the USDA's CRP and CREP programs, Chip Akridges notes that "... with careful design, these programs can recreate the natural habitat which was historically present in the area which will:

- a- Provide suitable habitat for the re-establishment and growth of vanished and existing wildlife species, including song birds, game birds, waterfowl, and upland game;
- b- Improve the quality of runoff into the Chesapeake Bay by minimizing the use of fertilizers, pesticides, and herbicides and by reducing erosion; and
- c- Replace suburban-type residential development sprawl with open space for the community at large to

## Stakeholders

The farm has become a showplace for on-the-ground implementation of the USDA's Conservation Reserve Program (CRP), Conservation Reserve Enhancement Program (CREP), and the Wildlife Habitat Incentives Program (WHIP). In early 2004, the Akridges worked with the Natural Resources Conservation Service (NRCS) and other cooperating agencies to develop design plans and conservation contracts for their property. In 2005, they completed installation of wetlands, vegetative buffer systems, shallow water areas, and other conservation practices as planned.

## Funding

CREP provides technical and financial assistance to eligible landowners to address soil, water and related natural resource concerns on their lands in an environmentally beneficial and cost-effective manner. The CRP encourages landowners to convert highly erodible cropland and other environmentally sensitive areas to permanent cover, such as introduced native grasses, trees, filter strips, riparian forest buffers, wetlands and shallow water habitats. In Maryland, CREP offers additional incentives to encourage landowners to implement practices that will help reduce sediment and nutrients in the Chesapeake Bay and will improve wildlife habitat.

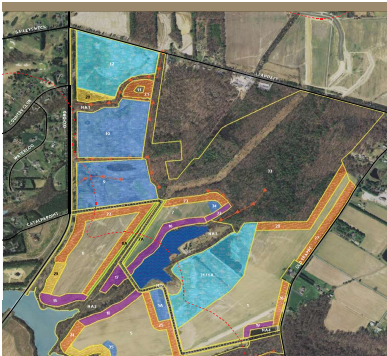


Figure 2 - Map



Figure 3 - Image of landscape

## Other

Water quality improvements associated with the buffer runoff were not measured scientifically due to lack of a pre-construction baseline data set and because other lands drained into Trippe Creek. However, the owners report a noticeable improvement in water clarity and sediment runoff from the property, noticeable after rainstorms. Wildlife observations made in artificial nesting structures erected in the constructed wetlands were documented by the owner. In the wetlands, duck production had increased from almost nothing, due to lack of habitat, to 445 wood ducks and 249 mallards in 2008. In the winter, migrating ducks and geese have been attracted to the new wetlands in large numbers. By flooding different cells at different times in the fall and winter, and thereby making new food sources available, the property supports waterfowl for long periods of time. A total of 146 bluebird boxes were installed in the buffers around the fields and the manager has observed huge increases in bluebirds, swallows, and grassland species of songbirds. A May 2008 survey showed 471 fledglings.

## Sources

Burke, D. G. and J. E. Dunn (editors). 2010. A Sustainable Chesapeake: Better Models for Conservation. The Conservation Fund, Arlington, VA. 278 pp.  
USDA Conservation Programs Improving Water Quality and Wildlife Habitat on Maryland's Eastern Shore By Clay Robinson and David G. Burke, 2010  
Retrieved from: [https://www.conservationfund.org/images/resources/sustainable\\_chesapeake/Sustainable-Chesapeake-](https://www.conservationfund.org/images/resources/sustainable_chesapeake/Sustainable-Chesapeake-)



# Friends of Trees

Portland, OR, USA

## Introduction

Friends of Trees was founded in 1989 by a community member who loved trees and started planting them in Portland neighborhoods. Today, Friends of Trees is a nationally recognized, regional leader in improving the urban tree canopy and restoring sensitive natural areas through programs delivered by thousands of volunteers. Friends of Trees recognizes that not everyone has equal access to the benefits of trees and healthy urban green spaces. As a community driven organization, Friends of Trees, strives to foster an atmosphere of inclusion and support to continue to build places that are safer and healthier for all. This is accomplished through authentic community conversation, unique partnerships, relevant programming, and attracting and retaining diverse staff and supporters.

## Goals

Planting street and yard trees and growing healthy neighborhoods is the goal of the Neighborhood Trees Program. Friends of Trees engages with a wide variety of partners including community volunteers, businesses, municipalities, and other nonprofit organizations in order to bring the benefits of trees to as many people as possible. Friends of Trees add trees to underserved, low-canopy neighborhoods going door-to-door with information about the program and providing trees at no cost if price is a barrier. Friends of Trees also provides tree care.

### Green Space Planting Program:

This program restores natural areas and connects youth to the environment. Friends of Trees contributes to the health of natural areas through educational programming that helps grow the next generation of environmental stewards; they actively and meaningfully connect youth with nature through classroom curriculum and hands-on field work.

### Volunteer and Outreach Program:

Friends of Trees strives to create events that are welcoming for all and are committed to helping as many communities as possible enjoy the benefits of trees. Friends of Trees works to reach underserved, low-canopy neighborhoods with information about how to volunteer and how to get a tree, so they strategically participate in outreach activities to reach diverse communities.



Figure 1 - Graphic showing achievements of Friends of Trees

## Stakeholders

The stakeholders of Friends of Trees include its Portland and Eugene staff members, its board of directors, donors, volunteers, and other members of the community that benefit from the programs. Donors include community and municipal planting partners, foundations, businesses, corporations, and individuals.

## Funding

Friends of Trees receives funding primarily through government grants, foundation grants, corporate donations, individual donations, and memberships. In 2018, Friends of Trees received \$2.6 million in funding to be used for tree planting and other program expenses.

## Other

In 2018, Friends of Trees planted over 50,000 trees and native shrubs using over 6,000 volunteers. Since the founding of Friends of Trees, over 750,000 trees and native shrubs have been planted.



Figure 2 - Graphic showing benefits of trees

## Sources

Friends of Trees, friendsoftrees.org/about. Accessed 11/24/2019



# 50 Million Trees

Ontario, Canada

## Introduction

Ontario began the 50 Million Trees program in 2008 as part of Forests Ontario, a non-profit charity supported by volunteers, sponsors, and donors. Forests Ontario has several tree planting programs and initiatives. Property owners apply through a form, and if they qualify, the program provides them with financial and technical assistance to increase forest cover on their land. It provides property owners with financial and technical assistance to increase forest cover on their land for the benefit of the province.



Figure 1 - Image to advertise 50 Million Trees Program

## Goals

The goal of 50 Million Trees is to plant 50 million trees by 2025. So far, the program has helped more than 4,000 landowners get involved to plant over 27 million trees. The program also seeks to:

- Reduce the cost of large-scale tree planting for land and property owners, leading to an increase in forest cover in Ontario
- Reduce annual ecosystem services such as pollination, recreation, aesthetics and water supply regulation through tree planting
- Improve wildlife habitat, connect forests, to leave a legacy for future generations, for recreation or to reap sustainable forest products

## Stakeholders

The 50 Million Tree Program is for the overall benefit of the province of Ontario. It is supported by the Government of Canada, corporate sponsors, and donors. The program is run through Forests Ontario, a non-profit organization. Partners include private tree nurseries, conservation authorities, stewardship groups, First Nations, forestry consultants and municipalities, such as Mastwood Consulting, Toronto and Region Conservation Authority, Arbor Day Foundation-Community Tree Recovery, Community Forests Canada Inc., and others.

## Funding

50 Million Trees is funded through Government of Canada, corporate sponsors, and donors. It is a non-profit organization that relies on outside funding and volunteers. The program was previously funded solely by the Government of Ontario, but opened up to corporate sponsorship and donations in 2019. Partners include private tree nurseries, conservation authorities, stewardship groups, First Nations, forestry consultants and municipalities.



Figure 2 - Graphic showing where trees have been planted

## Other

Forests Ontario has planted more than 27 million trees through the 50 Million Tree Program since it began in 2008, sequestering more than 21,000 tons of carbon annually. Trees are counted by seedlings planted. Below is a map shown on Forest Ontario's program website, showing where seedlings have been planted. Forests planted to date under the program now generate over \$83- million in annual ecosystem services such as pollination, recreation, aesthetics and water supply regulation. Progress is recorded on an online reporting system that collects data on seed sources, planting sites, and survival rates.



Figure 3 - Image of Canadian forest

## Sources

Forest Ontario. 50 Million Trees. 2019. <https://www.forestsontario.ca/planting/programs/50-million-treeprogram/> Accessed 11/22/2019



# PLANTapsco

Patapsco Valley, MD, USA

## Introduction

Patapsco Heritage Greenway (PHG) focuses its efforts on restoring the riparian zone around the Patapsco River. The PLANTapsco program is an attempt to generate more funding for tree plantings in the riparian zone through individual donations.

One thing that sets PHG apart is that after a tree planting they return to the site and maintain the trees on a regular basis. As an intern in 2014-2015, I saw the high survival rate of the trees planted.



Figure 1 - PLANTapsco logo and picture of volunteers planting trees

## Goals

All of these goals are achieved through staff and volunteer efforts. The cost per tree on the PLANTapsco donation page is 50 dollars per tree planted. The higher cost is partly due to the size of trees planted and the effort spent protecting and maintaining trees after they are planted. These additional investments help ensure that trees grow to maturity and helps to protect the surrounding environment from invasive plants. PHG organizes events for volunteers, sometimes open to the public and sometimes just for a specific organization.

Paid staff and interns help educate people about how to safely and properly plant trees and undertake other environmental restoration projects in the stream valley.

## Stakeholders

Howard County  
Baltimore County  
BGE  
Keep Maryland Beautiful  
REI  
As well as the board of trustees, members, and donors.



Figure 2 - Map showing Patapsco Valley Heritage Area

## Funding

PLANTapsco is a new fundraising campaign designed to get individuals to donate directly to subsidize tree planting costs to get more trees planted. As a new program, it is too early to measure results.



Figure 3 - Graphics created by PLANTapsco

## Sources

Patapsco Heritage Greenway. (2019). Retrieved 25 November 2019, from <https://patapsco.org/>

Patapsco Valley Heritage Area. (2019). Retrieved 25 November 2019, from <https://www.facebook.com/PatapscoValley/>



# Million Trees NYC

New York City, NY, USA

## Introduction

In 2007 New York City set out to plant and care for one million trees over the next decade across the five boroughs. The program aimed to plant 220,000 street trees, 480,000 parks and other public spaces trees, and 300,000 trees planted by private partners. This adds up to a grand total of one million new trees. Trees increase the quality of life in NYC and improve the environment by increasing tree canopy and urban forest throughout the city. This effort will help increase the tree canopy and urban forest in throughout NYC.



Figure 1 - Kids watering a tree

## Goals

The main goal of this effort is to plant and care for one million trees. This is achieved by engaging New Yorkers to volunteer to help plant these trees. Free trees will be provided to property owners each season if they register for the giveaway. New Yorkers can also call the City's 3-1-1 hotline or request online for a street tree to be planted. Another goal of this project is public education. Educational resources are provided for educators and kids to help the public learn about trees and the environment.

## Stakeholders

Million Trees NYC needs the help of many different groups to be successful. New Yorkers themselves need to feel a sense of responsibility over the trees in their community in order to have volunteers help plant and care for them. The New York Restoration Project and the New York Restoration provide the most support to the effort. Other stakeholders include businesses, advocacy groups, researchers, volunteers, and non-profit organizations. All these groups support the effort to increase urban forest.

## Funding

There are many groups and individuals that donate to this effort. The lead sponsors are Toyota, TD Bank, and ConEdison. Many small businesses in NYC also donate time and money to planting efforts. Individuals can also donate to Million Trees NYC through the website. The top donors are The David Rockefeller Fund and Bloomberg Philanthropies. They also "offer grant programs through [their] partners to provide funding for community environmental projects across New York City".



Figure 2 - Trees ready to be planted

## Other

Another aspect of this initiative is encouraging citizens to care for the trees planted. The program provides "free training, tools, and a Parks Permit to work on both street and reforestation trees". The three main areas of tree care are water, weed, and mulch. The goal was achieved! One million trees have been planted in New York City as of 2016.



Figure 3 - Tag on tree advertising the program

## Sources

MillionTrees NYC. (n.d.). Retrieved November 24, 2019, from <https://www.milliontreesnyc.org/>





# Denver Digs Trees

Denver, CO, USA

## Introduction

Denver Digs Trees is a private, nonprofit program designed to help residents cultivate greener, healthier, and more vibrant communities. It provides free and low-cost trees to private and public properties. The species are selected to thrive in the local climate and urban environment. Applications open each January. Denver Digs Trees has planted more than 60,000 trees in the Denver area over the past 35 years.

The group is passionate about local parks, city trees and other shared community resources. It believes that healthy parks help grow healthy communities. They believe that our community forest not only makes our neighborhoods beautiful places to live, but provides critical functions to the health, wellbeing, and sustainability of urban life. And they believe that all Denver residents should have access to these critical urban resources. They also believe in the power of community action and of “thinking globally and acting locally”.

The group fulfills its mission by raising private funds for capital improvement projects of various sizes and through several ongoing programs: Denver Digs Trees, Community Forester, Mile High Tree Champions, and Park Legacy. It is Denver's oldest and primary city-wide park advocacy group and longest-standing tree organization. The group has infused tens of millions of dollars into the city's public spaces, and have planted more than 50,000 trees in Denver.

## Goals

Plant and maintain medium and large sized trees to provide shade within the city of Denver.

## Stakeholders

This program is run through a group called The Park People. They rely on their funding partners heavily to make their work possible. Some of their funders include: Xcel Energy, Colorado Garden Foundation, Howard Lorton, Koelbel, OZ Architecture, Colorado 811, MDC Richmond American Foundation, Giving Back Group, Arbor Day Foundation, First Western, Stapleton United Neighbors, Metropolitan State University of Denver, RS&H, ink! Coffee, Dumpsters.com, Agility Recovery, and Credera.



Figure 1 - Serviceberry trees balled and burlaped



Figure 2 - Volunteer pruning tree

## Funding

On average, each tree costs The Park People \$150 to provide. Generous sponsors help subsidize much of the expenses that DDT accumulates. Trees are offered at two prices. A standard “yard tree” costs \$35. In a Target Neighborhood, the cost is \$10. Applicants facing financial hardship may request a ‘Treeship’ to receive free trees.

## Other

Email reminders are sent out to participants in order to keep members updated. DDT provides free planting and care guides, as well as free planting and care workshops. All trees planted through Denver Digs Trees support the Be A Smart Ash campaign/effort to proactively plant the city forest in the face of the Emerald Ash Borer.



Figure 3 - Volunteers

## Sources

“What We Do.” The Park People, [theparkpeople.org/What-WeDo/](http://theparkpeople.org/What-WeDo/) Denver-Digs-Trees.





# Baltimore Tree Trust

Baltimore, MD, USA

## Introduction

The Baltimore Tree Trust (BTT) in Baltimore City aims to establish more urban forests in the City. The program has planted over 5,500 trees on private property and in low-canopy neighborhoods since 2008. The initial goal of the project was to help cool and improve the living space of the Harris Creek Watershed, an area that was a main urban heat island.

## Goals

The Trust's main goal is to increase the amount of urban trees to cool ambient temperatures, provide shade, and encourage community engagement. The Trust strives to plant 10,000 trees per year and have a 40% urban tree canopy cover in Baltimore. The BTT also operates a forest mitigation program that will plant trees for developers who might otherwise pay mitigation fees to the City.



Figure 1 - Map of Harris Creek Watershed

## Stakeholders

The BTT has several partners and funders including Baltimore City Department of Public Works, Chesapeake Bay Trust, DNR, and National Fish and Wildlife Foundation. The Trust also relies on volunteers and donations. Funding of the program primarily comes from funds from the State, city, foundations, corporations, and individuals.

## Benefits

The BTT is very active in the community. They have developed a program called Urban Roots Apprenticeship. This program aims to strengthen the workforce for tree care and landscape industries. The program, working with the Center for Working Families, recruits potential employees, then trains and mentors them for success in environmental work. BTT also works with the youth through workshops, school tree plantings, and providing paid summer internships.



Figure 2 - Before and after tree planting image

## Other

The BTT website provides maps, including a Baltimore tree inventory that allows users to identify locations for tree planting. It also shows tree pits, stumps, and dead trees. Other resources on the site are the EPA's environmental justice screening and mapping tool and NOAA's urban heat island study results in Baltimore.

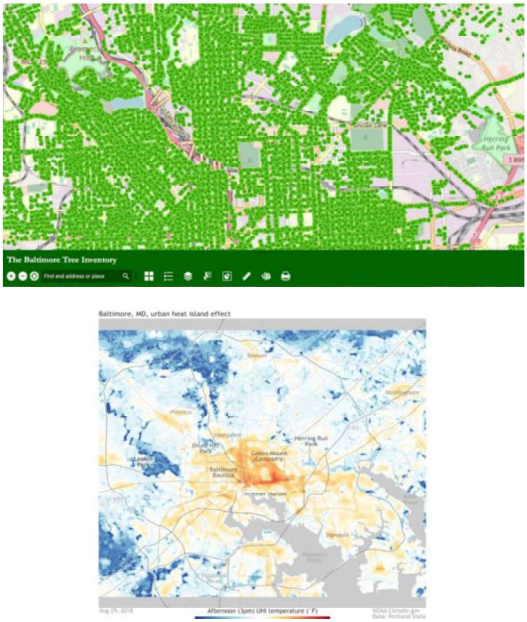


Figure 3 - Baltimore tree inventory, Figure 4 - Map of Baltimore heat island effect

## Sources

ArcGIS Web Application, [baltimore.maps.arcgis.com/apps/webappviewer/index.html?id=d2cfbbe9a24b4d988de127852e6c26c8%2B](https://baltimore.maps.arcgis.com/apps/webappviewer/index.html?id=d2cfbbe9a24b4d988de127852e6c26c8%2B).

"Home." Baltimore Tree Trust, 2019, [www.balimoretreetrust.org/](http://www.balimoretreetrust.org/).

"Hot Days in the City? It's All about Location." Hot Days in the City? It's All about Location | National Oceanic and Atmospheric Administration, NOAA, 15 Oct. 2018, [www.noaa.gov/news/hot-days-in-city-it-s-all-about-location](http://www.noaa.gov/news/hot-days-in-city-it-s-all-about-location).



# Floura Teeter

Baltimore, MD, USA

## Introduction

Contracted by the Maryland State Highway Administration, the landscape architecture firm Floura Teeter undertook a planning analysis of tree planting in Baltimore and Harford Counties using GIS and GPS to inventory and assess sites where trees could mitigate runoff. Ultimately, they chose 18 sites and planted 37.46 acres.

They began with site analysis, meeting with clients and stakeholders to determine the priorities of each site. They developed and used a system of metrics to assess site viability. Metrics included the presence of environmental features, site access, utilities, and other conditions that prohibit planting.

GIS data was used to create mapping plans and survey stakeout plans. Tree species were determined by the unique environmental conditions of each site. Floura Teeter considered hydrology, intended ecology, and local microclimates to determine plantings. All sites were planted by the end of 2018.

Floura Teeter was then able to access the benefits of their plantings using iTree. This tool allowed them to model benefits including storm water runoff interception, air quality improvements, and carbon sequestration.

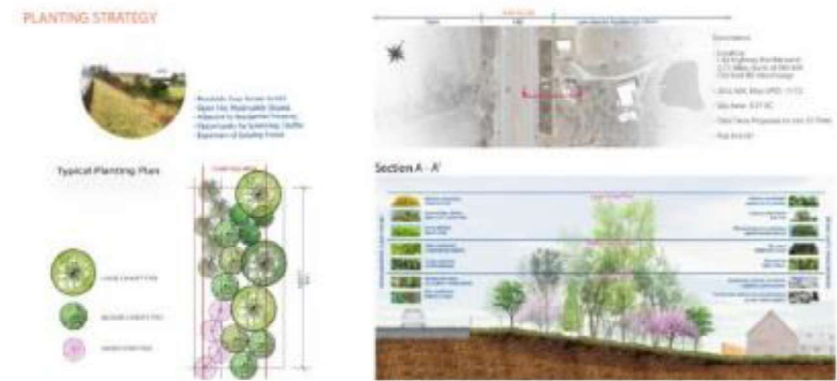


Figure 1 - Graphic showing proposed planting

## Goals

Maryland State Highway Administration's goal was to reduce the amount of nitrogen and phosphorous draining into the Chesapeake Bay from impervious surfaces during rain events. To accomplish this goal Floura Teeter inventoried and assessed different sites to understand their Total Maximum Daily Load, which is the highest level of pollutants that can drain into a body of water without causing it to exceed water quality standards.



Figure 2 - Map showing site location for tree plantings

## Stakeholders

The stakeholders for this project are the Maryland State Highway Administration and the citizens of Maryland since this is a state funded project. Additionally, the Chesapeake Bay and organizations involved with its environmental health and well being of the Chesapeake Bay are stakeholders because they are directly affected by the outcomes of this project.

## Funding

This project was funded by the Maryland State Highway Administration.

## Benefits

Floura Teeter calculated the benefits of their reforestation efforts. They used iTree (a calculation tool developed by USDA forest service) to calculate the benefits of the roughly 37 acres they planted. This totaled to 43,954,850 gallons of storm water runoff interception which is valued at \$35,602. The air quality improvements totaled \$31,480. The trees also sequestered 5,832,716 pounds of carbon, valuing \$103,180 in benefits. These metrics were based on iTree data for a duration of 20 years after planting

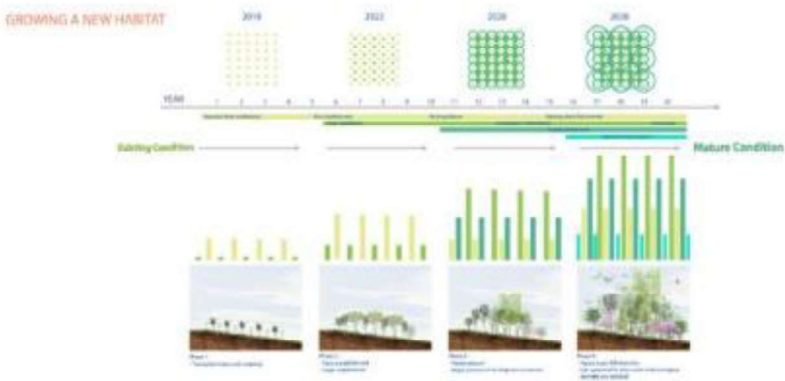


Figure3 - Graphic showing tree growth projections

## Sources

Floura Teeter. TMDL Tree Planting. 2018. Website. <http://flourateeter.com/about/case-studies/tmdl-treeplanting/>. Accessed 12/4/2019



# Trees for Neighborhoods

Seattle, WA, USA

## Introduction

The Trees for Neighborhoods program aims to improve the city's quality of life by distributing trees to homeowners. Since the program's conception in 2009 it has distributed over 10,300 trees. The program allows applicants to receive as many as four trees at a time with a maximum of six trees per household. The goal of this project is to increase urban canopy and improve the overall health of communities. More trees mean more shade, lowering air temperatures on summer days. Trees also work to clean air and water, improving the overall health of the Seattle area. This not only helps the environment, but it also improves the quality of life in the area and makes the city a much more desirable place to live at a relatively low cost for the city.

## Goals

In the 1970s, Seattle had about 40% tree cover, but as residents and development increased, tree cover decreased. Trees were unevenly distributed through the city and threatened by disease. As well, many trees were reaching the end of their life expectancy and needed to be replaced. As Seattle realized these increasing issues it established two goals for future canopy coverage. The first is to reach 30% canopy cover by 2037, and the second is to eventually return to 40% coverage. Their 2037 goal is a slight but noticeable increase from the current canopy coverage of 28%. Because more than two thirds of land in the City is privately owned, Trees for Neighborhoods was created to get trees planted on privately owned property and further increase canopy coverage past the goal of 30%.

The program also aims to be inclusive and available to all, offering free planting services to participants who are physically unable to plant a tree or who don't have the means to transport a tree to their property. The program also rotates species of trees on a yearly basis to prevent overpopulation of any one species.

## Stakeholders/Funding

Seattle runs the Trees for Neighborhoods program and therefore takes on all of the upfront costs such as the trees as well as mulching and watering supplies. However, once the trees have been planted, participants bear the rest of the costs themselves. While this is a lot less than the original cost, participants are expected to care for the trees two to three times per week in each of the next five summers after planting the tree. They are also expected to mulch and water the tree and cover the costs of these as necessary. In the end, most of the cost is absorbed by the city while most of the caring for the tree is done by the residents that receive the trees. Seattle also covers the costs of workshops which participants are required to attend as well as all costs involved with housing and distributing the trees.



Figure 1 - Volunteers planting trees

## Other

Along with giving out the trees, the city also provides workshops for all participants who are accepted into the program. The goal of these workshops is to make sure that people aren't making mistakes and killing trees while they are still young and at their most vulnerable. Along with workshops, Trees for Neighborhoods visits all of the trees planted in the last two years to evaluate tree health and gives tips to participants about how to improve the growth of their trees. These follow-up steps help ensure that trees are planted where they can thrive. This is a year-round program and can provide advice about tree health in all seasons. Because the program offers different species, all properties can accommodate tree planting, even low-growing species that will thrive under power lines. This means that even if a participant isn't eligible to receive all of the species, they should be eligible to receive at least one or two of the species.

## Sources

"Trees For Neighborhoods." Trees For Neighborhoods, 2019, [www.seattle.gov/trees/planting-and-care/trees-forneighborhoods](http://www.seattle.gov/trees/planting-and-care/trees-forneighborhoods). Accessed 11/24/2019  
Dolan, Maria. "The Struggle to Save Seattle's Urban Trees in the Face of Development." Seattle Magazine, October 2017

# One Tree Planted

Vermont, USA

## Introduction

One Tree Planted is a 501(C)(3) non-profit organization which was started in 2014 on a mission of global reforestation. They plant trees in North America, Latin America, Africa, and Asia.

In their program, every dollar plants one tree in the region of the donator's choice. The organization pools the donations for each project and sends the funds to their reforestation partners who then choose the best tree species to plant depending on the project and work with local communities to get those trees in the ground. The organization vets their partners to ensure that the survival rate of a tree can reach 80-90%. Once all the trees are planted, they send out a report highlighting the impact of the trees to donators.

Donors can also take part in hands-on tree planting event sponsored by the organization.

## Goals

As an environmental charity with the mission of global reforestation, One Tree Planted also educates about the value of trees. The goal is to encourage individuals and businesses to help create a healthier climate, protect biodiversity by supporting world-wide reforestation efforts.



Figure 3 - Volunteers plant trees

## Stakeholders

Created in 2014 by Matt Hill, a father and nature-lover who wants to make sure future generations can enjoy the great outdoors, One Tree Planted has a team with members specialized in different areas and enthusiastic about tree planting.

People can get involved as individuals, schools, as well as businesses. This organization has partners worldwide, including TransPak, Marley, Trafalgar, CIT, Acorns, and Adidas.

## Funding

Funding comes from donations from individuals and businesses. Products such as t-shirts, tree kits, and cards are also sold online to raise funds--every product purchased plants one tree.

As a 501 (C) (3), One Tree Planted files annual revenue and expense reports with the IRS.

FISCAL YEAR ENDING DEC. <b>2017</b>	<b>Total Revenue \$341,752</b>	
	Total Functional Expenses	\$279,876
	Net income	\$61,876
PDF 990 Full Text 990 - Raw XML 990	<b>Notable sources of revenue</b>	
	Contributions	\$341,752
	Program services	\$0
	Investment income	\$0
	Bond proceeds	\$0
	Royalties	\$0
	Rental property income	\$0
	Net fundraising	\$0
	Sales of assets	\$0
	Net inventory sales	\$0
	Other revenue	\$0
	<b>Percent of total revenue</b>	
	Contributions	100%
	Program services	\$0
	Investment income	\$0
	Bond proceeds	\$0
	Royalties	\$0
	Rental property income	\$0
	Net fundraising	\$0
	Sales of assets	\$0
	Net inventory sales	\$0
	Other revenue	\$0
	<b>Notable expenses</b>	
	Executive compensation	\$0
	Professional fundraising fees	\$0
	Other salaries and wages	\$0
	<b>Percent of total expenses</b>	
	Executive compensation	\$0
	Professional fundraising fees	\$0
	Other salaries and wages	\$0
	<b>Other</b>	
	Total Assets	\$202,122
	Total Liabilities	\$15,554
	Net Assets	\$186,568

Figure 2 - 2017 finances for One Tree Planted

## Other

One Tree Planted has more than doubled the number of trees planted year over year. In 2018, they planted 1.3 million trees.

On their website, people can also find information about the reasons why trees are so important to our planet in terms of air, water, biodiversity, social, health, and climate.

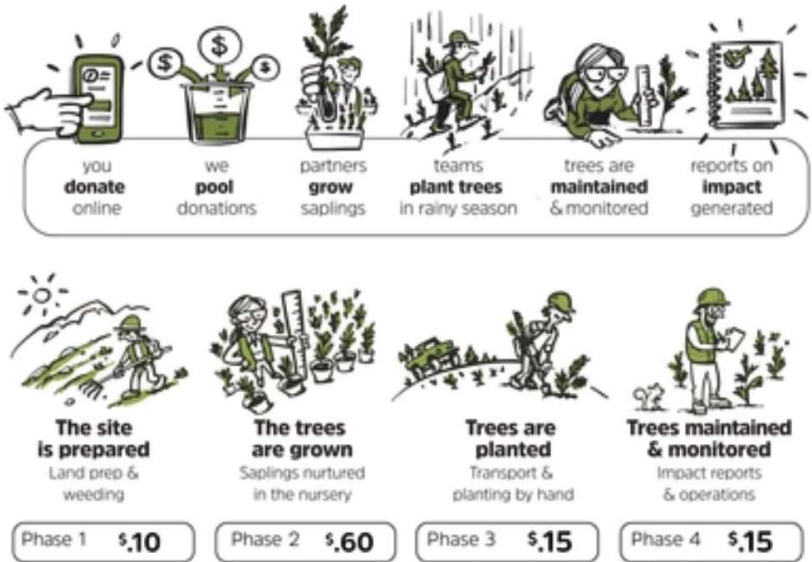


Figure 3 - Graphic produced by One Tree Planted

## Sources

One Tree Planted. <https://onetreeplanted.org/> Accessed 11/24/2019

PROPUBICA Nonprofit Explorer Research Tax-Exempt Organizations. <https://projects.propublica.org/nonprofits/organizations/464664562> Accessed 12/05/2019



## Introduction

Canopy was founded in 1996 to address the decrease in Palo Alto's urban forest. In 2002, it became a 501 (C)(3). In 2018, Canopy's 1,500 volunteers planted 323 trees and 784 landscape plants on 12 sites throughout the city. The City now cares for about 36,000 urban trees.



Figure 1 - Canopy volunteers

## Goals

Engage multiple stakeholders

- Educate communities about tree care and benefits
- Long-term Stewardship
  - o Community engagement
  - o Focus on youth, the next generation of environmental leaders
- Advocate for urban forests at the local, state, and national level
- Focus on underprivileged communities

## Stakeholders

Canopy has a small experienced staff and board of directors that lead the organization towards its goals. There are many engaged partnerships with the organization, including with the municipal government, local K-12 schools and colleges, urban forestry companies, and community groups and volunteers.

## Funding

Canopy's 2019 budget is \$1,044,000. In 2018, Canopy spent \$814,044 in operating expenses but made \$848,164 in operating revenue. Of their funds, 23% comes from city contracts and earned income, 22% comes from assets released from restriction, 19% comes from individual donor contributions, 17% comes from foundation and corporate grants, 11% comes from fundraiser net proceeds, and 8% from government grants. Of their expenses, 71% went to advocacy programs, 18% went back into fundraising, and 11% went towards paying Canopy's administration.

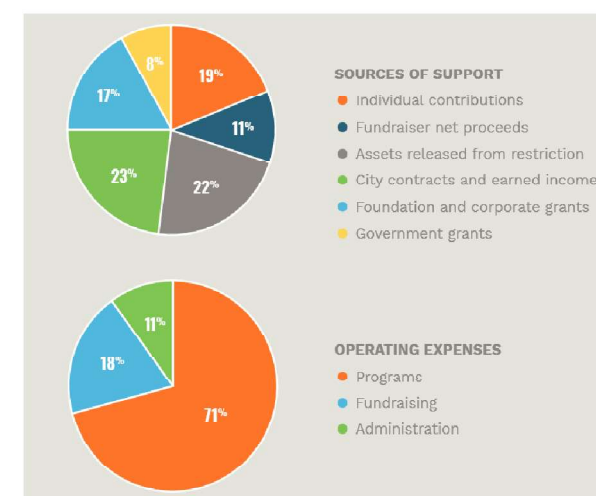


Figure 3 - Graphs

## Other

Canopy has several programs for tree advocacy, including tree planting, lessons for tree care, tree walks, community events and workshops, school programs, urban forest advocacy, and community service. Canopy publishes several yearly reports on different topics such as Canopy Impact, Maintenance, and Financial Analysis.

They have an online tree inventory map that also allows users to calculate a tree or a group of tree's economic benefits.

An analysis was done on Palo Alto and determined that their new tree population is a cost-effective resource that provides annual benefits of roughly \$6.5 million. The benefits include energy savings, air quality improvements, CO2 reduction, and aesthetic improvements. Since Palo Alto spends \$2 million per year on their tree repopulation mission, the community reaps an overall benefit of roughly \$4.5 million.

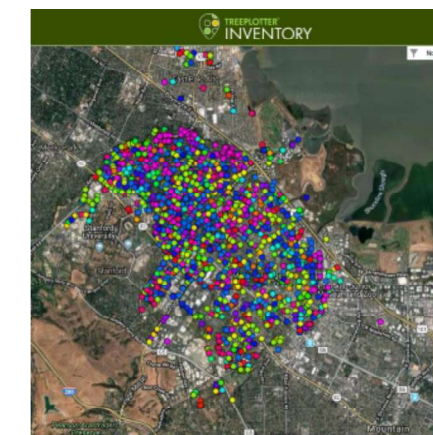


Figure 3 - Map showing trees planted

## Sources

Canopy. "Healthy Trees, Healthy Communities." Canopy, 2019, <http://canopy.org/>. Accessed 11/24/2019.

# Environomica

Magdalena, Colombia

## Introduction

This tree planting effort is an educational initiative for public schools in the high conservation value forests of the Buritaca Basin, Sierra Nevada de Santa Marta, Department of Magdalena, Colombia. The program was funded by the British foundation Rainforest Concern and is based on partnerships with local schools, an association of Community Based Organization (CBO) of local forest dwellers, and ENVIRONOMICA.



Figure 1 - ENVIRONOMICA logo

## Goals

Canopy was founded in 1996 to address the decrease in Palo Alto's urban forest. In 2002, it became a 501 (C)(3). In 2018, Canopy's 1,500 volunteers planted 323 trees and 784 landscape plants on 12 sites throughout the city. The City now cares for about 36,000 urban trees.

The program also seeks to promote local economies based on harvesting forest products and managing the forest as a sustainable ecosystem. Focusing on local labor and resources can generate ongoing support for the program goals.

Finally, the group seeks to increase forest restoration in targeted area by planting, monitoring, and maintaining native trees. Continuing its local approach, Environomica teaches local residents restoration practices.

## Stakeholders

Donors:  
WWF Italy and Colombia  
Global Heritage Fund (GHF)  
Rainforest Concern  
Sponsors:  
Treedom  
CAS Trips  
Be Local Tour  
The White Ribbon  
Partners in Colombia:  
Prosierra  
Foundation Pez Leon (FPL)  
Coral Morphologic  
Ecoral  
Asociación de Profesionales Sendero

## Funding

Funding for the group's forest ecology classes and reforestation program is from Rainforest Concern, which was established in 1993. Rainforest Concern has since expanded with projects around the world.

The World Wildlife Fund in Italy and Colombia are partners in managing natural reserves, environmental restoration, and sustainable tourism. WWF Italy is a donor partner to the S.F.E.C. Program and WWF Colombia has endorsed the Program for the Sierra Nevada de Santa Marta. Global Heritage Fund GHF is a 501(c)(3) non-profit organization focused on preservation and responsible development of the most important and endangered global heritage sites in developing countries and regions. The Fund also operates in Colombia and is a donor partner to the S.F.E.C. Program.

## Other

With this initiative, individual donations have funded 3,390 trees of a goal to plant 10,000. Beyond tree planting, Environomica also works on water, farming, and soil projects—vital to sustainable everyday life.

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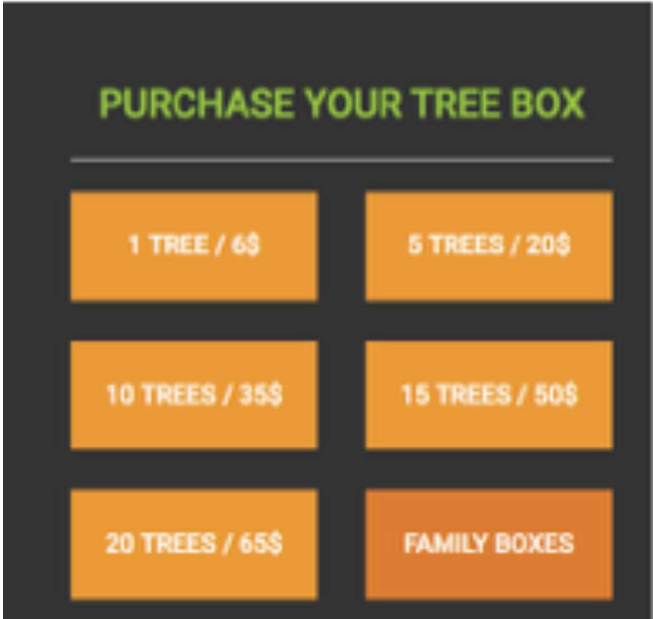


Figure 2 - customers can buy a tree box from their website

## Sources

<http://donations.environomica.org/memorialtrees.html>  
<https://www.rainforestconcern.org/about-us>  
[https://wwf.panda.org/wwf\\_offices/colombia/](https://wwf.panda.org/wwf_offices/colombia/)  
<https://www.treedom.net/en/>  
<https://globalheritagefund.org/>





# TreePeople

Los Angeles, CA, USA

## Introduction

TreePeople is a nonprofit that works to inspire people to take personal responsibility for the urban ecosystem. They support tree planting, rain harvesting, and landscape renewal projects, uniting communities in creating greener and more water secure cities, neighborhoods, schools, and homes.



Figure 1 - Community involvement in planting and maintaining local trees

## Goals

Los Angeles is rich in natural beauty, but its natural environment has been lost to urbanization. Paved surface prevent groundwater infiltration and the resulting runoff carries pollutants into the ocean.

TreePeople seeks to create a harmonious relationship with nature, incorporating development into the landscape to improve the community and preserve the planet.

Trees are vital to helping water to infiltrate into the soil. In Los Angeles, which imports 89% of its water, more trees would support the city's sustainability.

Trees also moderate the impacts of climate change, providing shade in hotter seasons. They consume the carbon dioxide released from fossil fuel use, and release needed oxygen.

## Stakeholders

CAL FIRE - The California Department of Forestry and Fire Protection is a leader in urban forestry and have helped plant and care for thousands of trees in Los Angeles.

Council for Watershed Health – The Council has participated in demonstration projects, presenting research and data on the positive impacts of urban trees.

Heal the Bay – This group pursues innovative water education programs to inspire Los Angelenos to recognize their role in caring for the urban environment.



Figure 2 - Volunteers plant trees

## Funding

As a nonprofit, TreePeople relies on donations from individuals and organizations. Funding partners include the California Water Foundation, the Leonardo DiCaprio Foundation, the Conservation Fund, and the Walt Disney Company Foundation.



Figure 3 - San Bernardino National Forest – 1974 vs 2017

## Other

TreePeople is a community-based organization that believes the first step toward change must involve local residents. For example, they have worked with the Social Justice Learning Institute on environmental justice issues in Inglewood and Lennox.

For more than 40 years, TreePeople has involved more than 3 million people in planting more than 3 million trees.

## Sources

"TreePeople Trees Then and Now." TreePeople, 12 Mar. 2019, [www.treepeople.org/thenandnow](http://www.treepeople.org/thenandnow).

# Capital Roots

Troy, New York, USA

## Introduction

Capital Roots is a non-profit food hub that serves four counties of the capital district in upstate New York. Their mission is, “to nourish healthy communities by providing access to fresh food and green spaces for all.” This is accomplished through many food related programs (like community gardens and a youth- operated urban farm), but also through promoting healthy streets and urban greening. The organization was started in 1975 to manage local community gardens and expanded into urban greening in 1989 before taking on their food access focus in the early 2000s with produce gleaning (Squash Hunger), a mobile produce market (the Veggie Mobile), and an urban farm (The Produce Project). They have planted thousands of trees in various cities the capital district over the past 30 years.

## Stakeholders

Partnering with a local municipality, Capital Roots accepts applications from local property owners to have street trees planted nearby their homes. The homeowner is then responsible for early watering and maintenance of the tree. The property owner (or a representative) is required to attend a Tree Care Workshop to learn how to properly care for their new tree. The actual tree planting is done by volunteers, bringing together corporate groups with individuals, board members, and high schoolers. Each team is led by staff members of the organization and learns from a brief demonstration before hand-planting trees.



Figure 1 - Staff demonstrates proper tree planting

## Funding

Capital Roots partners with local municipalities to apply for grants to plant trees. Most recently, tree planting was supported by a grant from TD Bank through the Arbor Day Foundation. These grants cover the cost of the trees, soil amendments, mulch, staff time for planning, and tools and supplies. When planting occurs in the city of Troy, the municipal tree committee helps determine the final siting of trees, and the city provides for delivery of trees to the planting sites from one of the community gardens.



Figure 2 - Volunteers plant a tree in Watervliet, NY

## Benefits

“Vibrant green spaces improve aesthetic appeal, increase property value and decrease energy consumption.” “Urban greening refers to public landscaping and urban forestry projects that create mutually beneficial relationships between city dwellers and their environments.”

## Other

Each tree is sited based on specific characteristics such as property owner preferences, root space, presence of overhead wires, and more. An in-office tree specialist determines which tree will best fit each site and coordinates purchasing from a local vendor. Capital Roots plants bare-root trees when the trees are dormant, often in the fall and sometimes in the spring as well. The lower cost of bare-root trees allows small cities to take advantage of this planting program and get the maximum impact from their funding. They are also lighter weight, allowing a greater diversity of volunteers to participate in planting.

The nursery where their trees are procured works closely with the Urban Horticulture Institute at Cornell where research has suggested that bareroot trees quickly catch up with larger balled and burlapped trees because the balled and burlapped trees lose a significant amount of their roots when they are harvested for transport and planting. Capital Roots buys trees with roots dipped in hydrogel and covered with plastic bags to keep them moist while in transit.

## Sources

About Urban Greening. (n.d.). Retrieved November 24, 2019, from <https://www.capitalroots.org/programs/urbangreening/urban-greening1/>.

City of Troy Street Tree Application. (2015). Retrieved November 24, 2019, from <https://www.capitalroots.org/files/1914/6239/1140/Applica tion 2015.pdf>.

S. DiLorenzo, Capital Roots Program Manager (Personal Communication, December 5, 2019)

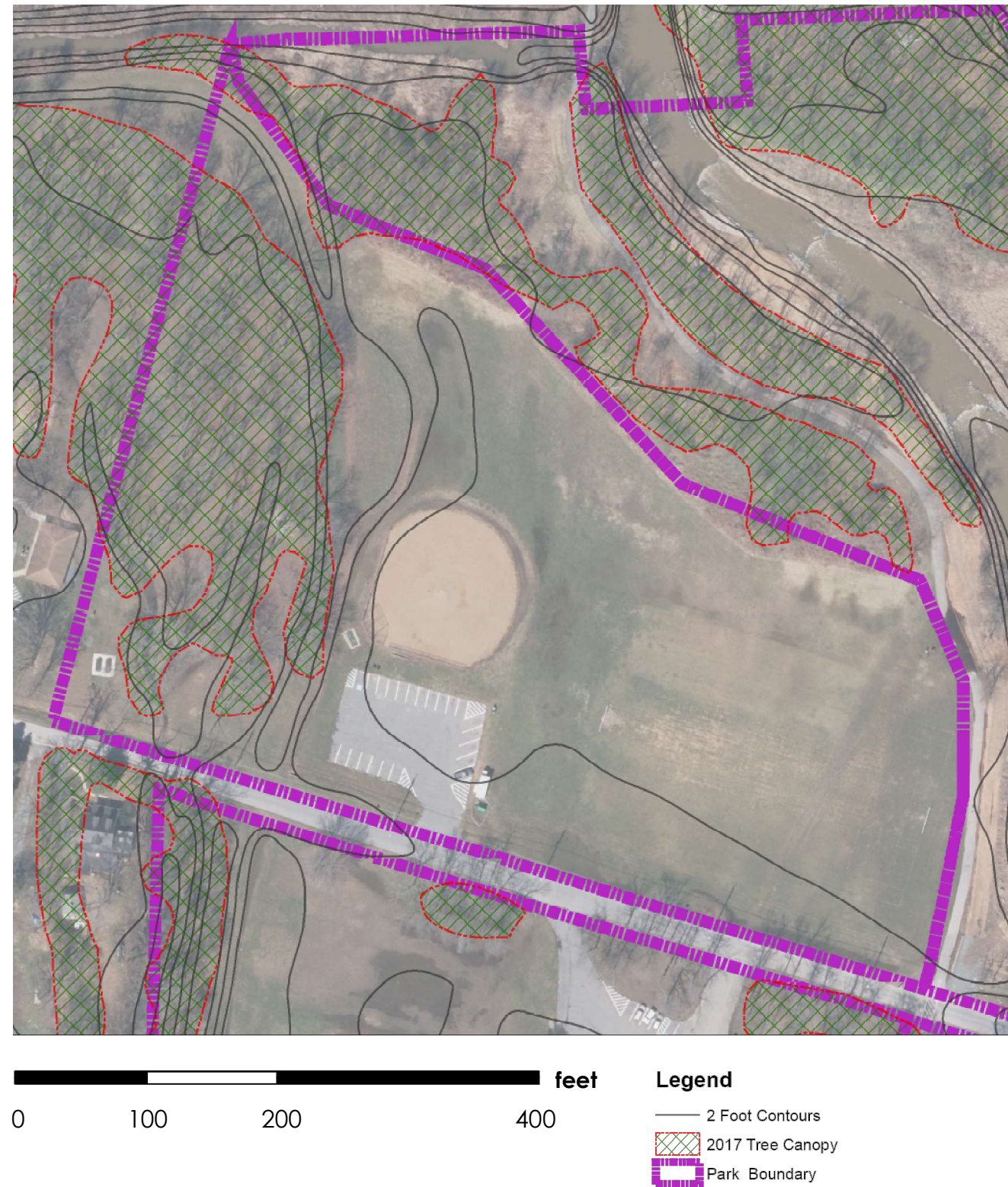


# Park Projects

# North Acredale



# North Acredale Park



## Vegetation Usage:

- Acts as buffers of the Paint Branch stream and the nearby forest
- Provides shade for park users during the warmer months
- Filters the pollutants in stormwater before it gets to the stream
- Provides amenities and habitats for wildlife
- Grass used as the primary vegetation for athletics

## Areas Needing Improvement:

- Areas of sparse vegetation and scattered edging planting, e.g., roadsides, along paths and playing fields
- Non-functioning grass swales, waterlogged along the roadside
- Sparse tree canopy in the relaxation area
- Stumps need to be removed

## Invasive Species:

- Types - *Ampelopsis glandulosa* (porcelain berry); *Rubus phoenicolasius* (wine-berry); *Lonicera maakii* (amur honeysuckle); *Hedera helix* (English ivy)
- Areas - behind the soccer field; along the edges of the surrounding forest area, especially in the veil and mantle

## Amenities:

A soccer field; a baseball field with bleachers; a parking lot; trail path; a picnic shelter; relaxation area with tables

## Vegetation Contributions to the Intended Activity:

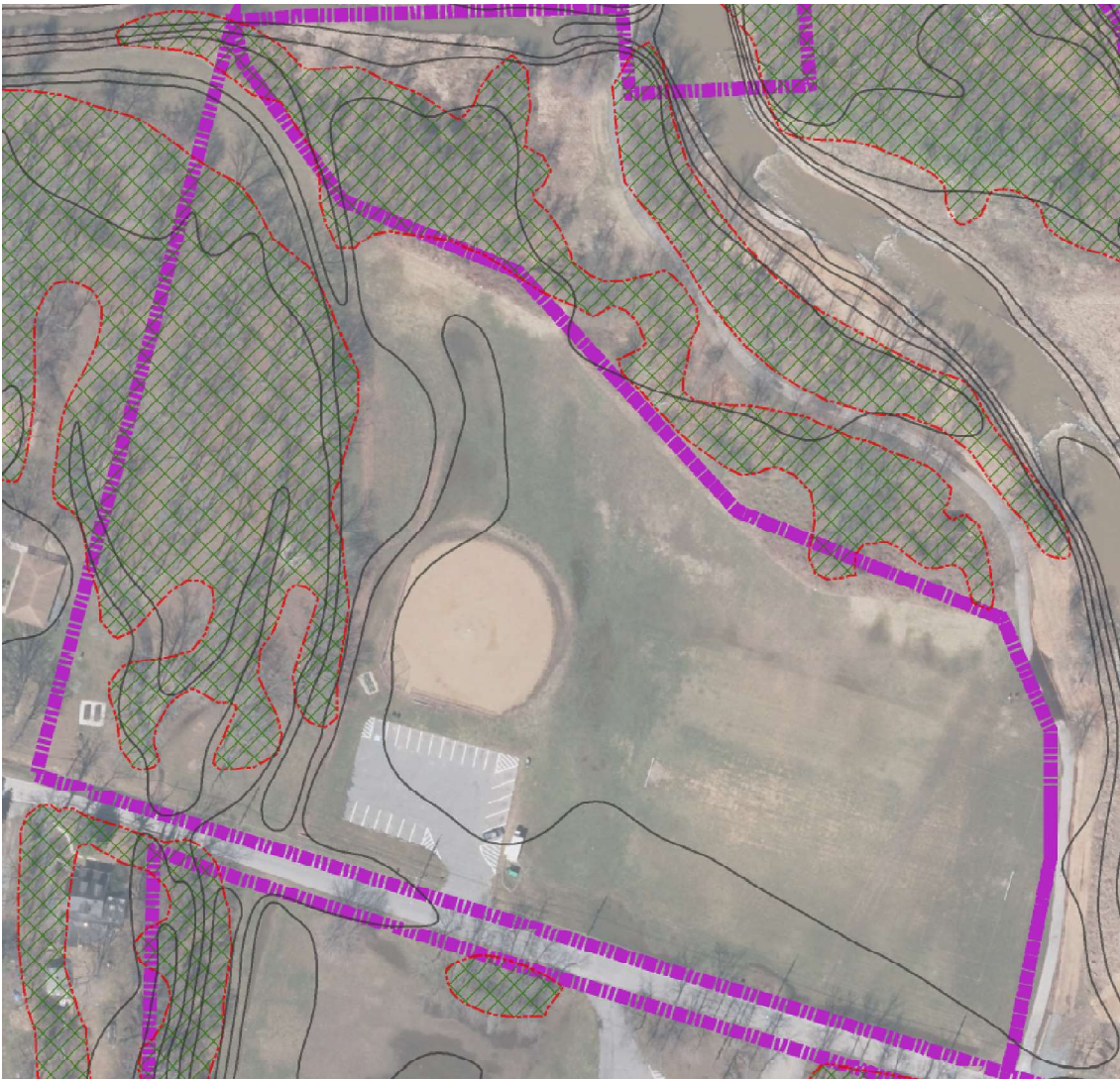
- Provides framing and borders the fields
- Separates neighboring park amenities
- Satisfies recreation purpose
- Creates an interesting experience and backdrop for walkers, runners, and bikers using the trail



# North Acredale Park



*Invasive vines in northern forest patch*



*Weedy understory & absence of canopy in Northeast*



*Northwest forest buffer with limited understory*



*Facing east towards paint branch stream*



*New tree plantings to the west*



*Ditch by parking lot*



*Newly planted trees*



*Paint Branch trail southeast of site*



# North Acredale Park



## Design Goals:

- 1) Regenerate the forest
- 2) Provide shade for recreation
- 3) Frame the space
- 4) Add buffers between impervious surfaces and usable space
- 5) Create visual interest
- 6) Create a habitat for pollinators

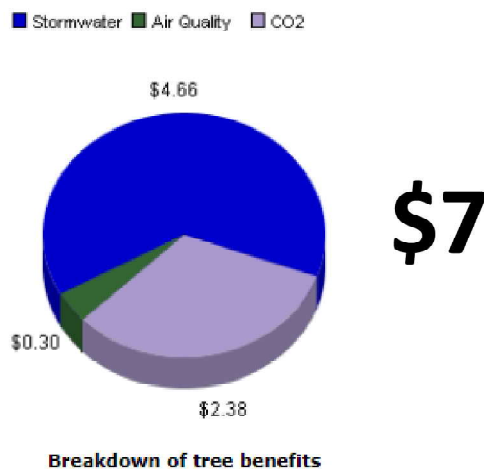
## Planting List:

Large Trees	3	Acer rubrum	Red maple	1
	10	Platanus x acerifolia	London planetree	1
	3	Platanus occidentalis	American sycamore	1
	10	Quercus phellos	Willow oak	1
Small Trees	10	Amelanchier arborea	Serviceberry	1
	8	Cornus kousa	Kousa dogwood	1
	12	Ilex opaca	American holly	1
	4	Lagerstroemia indica	Crape myrtle	1
	9	Magnolia virginiana	Sweetbay Magnolia	1
	19	Sassafras albidum	Sassafras albidum	1
Fruit Trees	6	Asimina triloba	Pawpaw	1
	6	Pyrus cornaria	Crabapple	1
100				

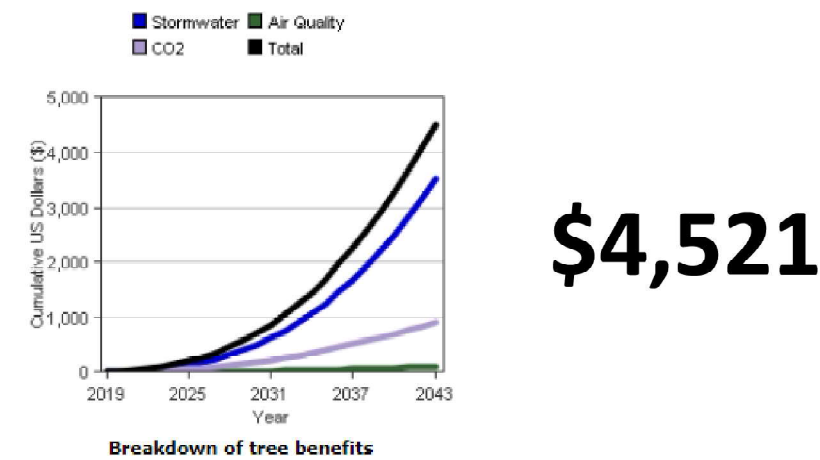
# North Acredale Park

## Recent Plantings: Three (3) Trees

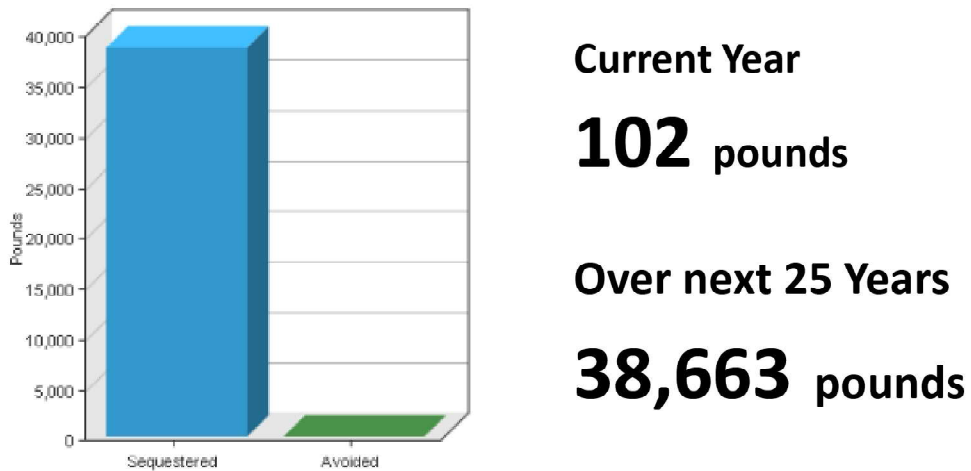
Current Year: Overall Benefits



Over the next 25 Years: Overall Benefits

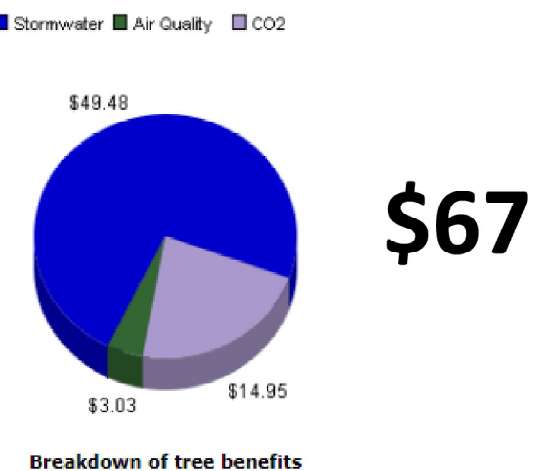


Sequestered Carbon

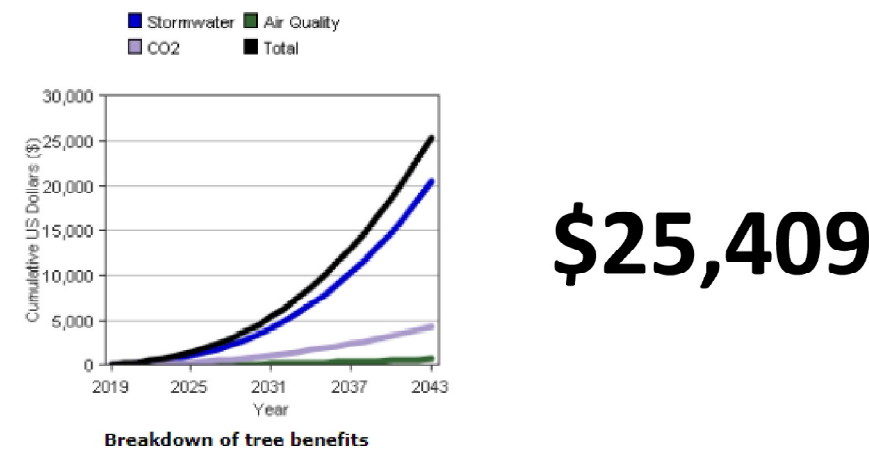


## Proposed Planting: Forty-three (43) Trees

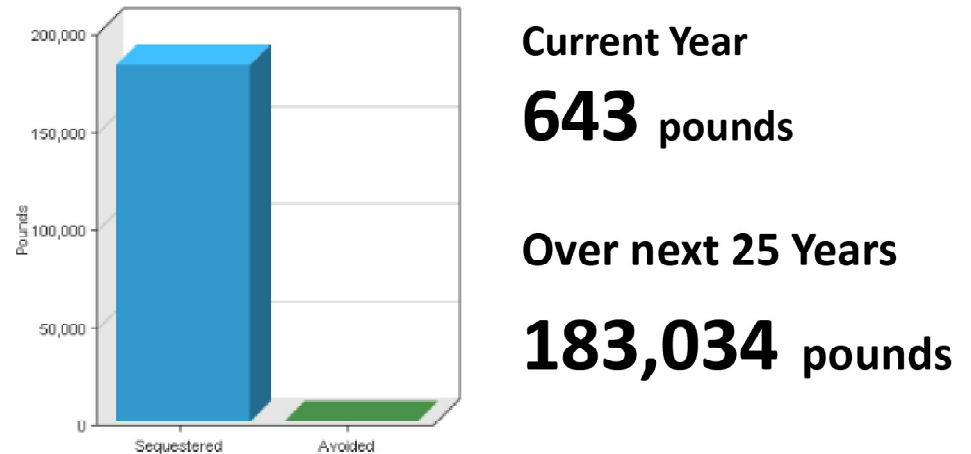
Current Year: Overall Benefits



Over the next 25 Years: Overall Benefits



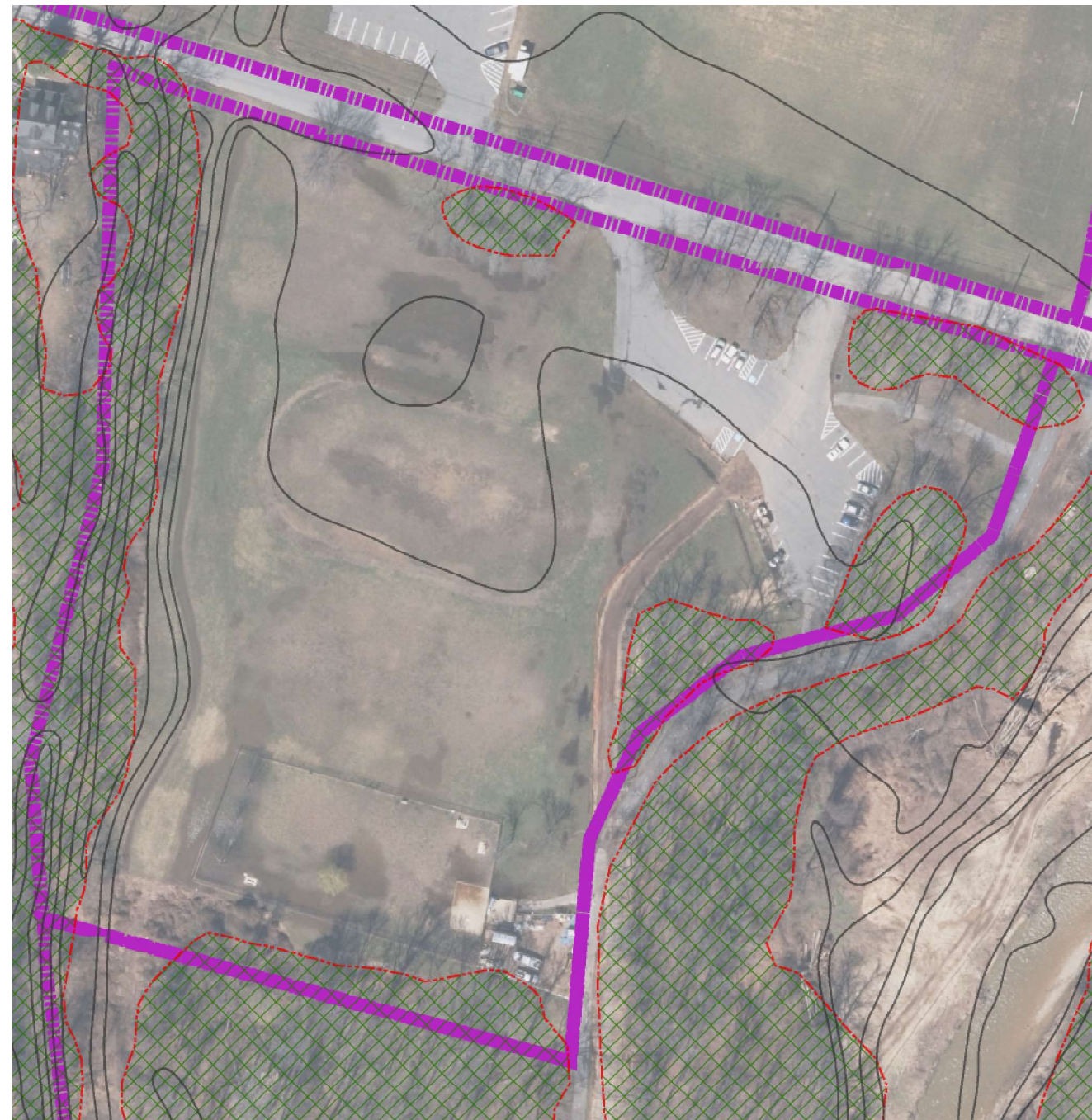
Sequestered Carbon





# South Acredale

# South Acredale Park



0 100 200 400 feet

## Legend

- 2 Foot Contours
-  2017 Tree Canopy
-  Park Boundary

## Amenities:

- open field used for multiple recreational activities such as: soccer and football
- large dog park
- parking lot
- large trail through the site

## Areas Needing Improvement:

- Dog park corner with trash, dead shrubs, tree debris
- Poor grass condition on more than half the site, causing erosion
- Lack of trees create extreme heat in the summer times
- Deep tire tracks created by mowing pattern
- Multiple areas of pooling water
- Unplanted areas resulting from Paint Branch stream restoration

## Invasive Species:

- *Lonicera Maackii* (Amur Honeysuckle) - located towards the right far end of the site.
- *Rubus armeniacus* (Himalayan blackberry) - located towards the right far end of the site.
- *Toxicodendron radicans* (Poison Ivy) - located towards the right far end of the site.

## Recommendations for Site:

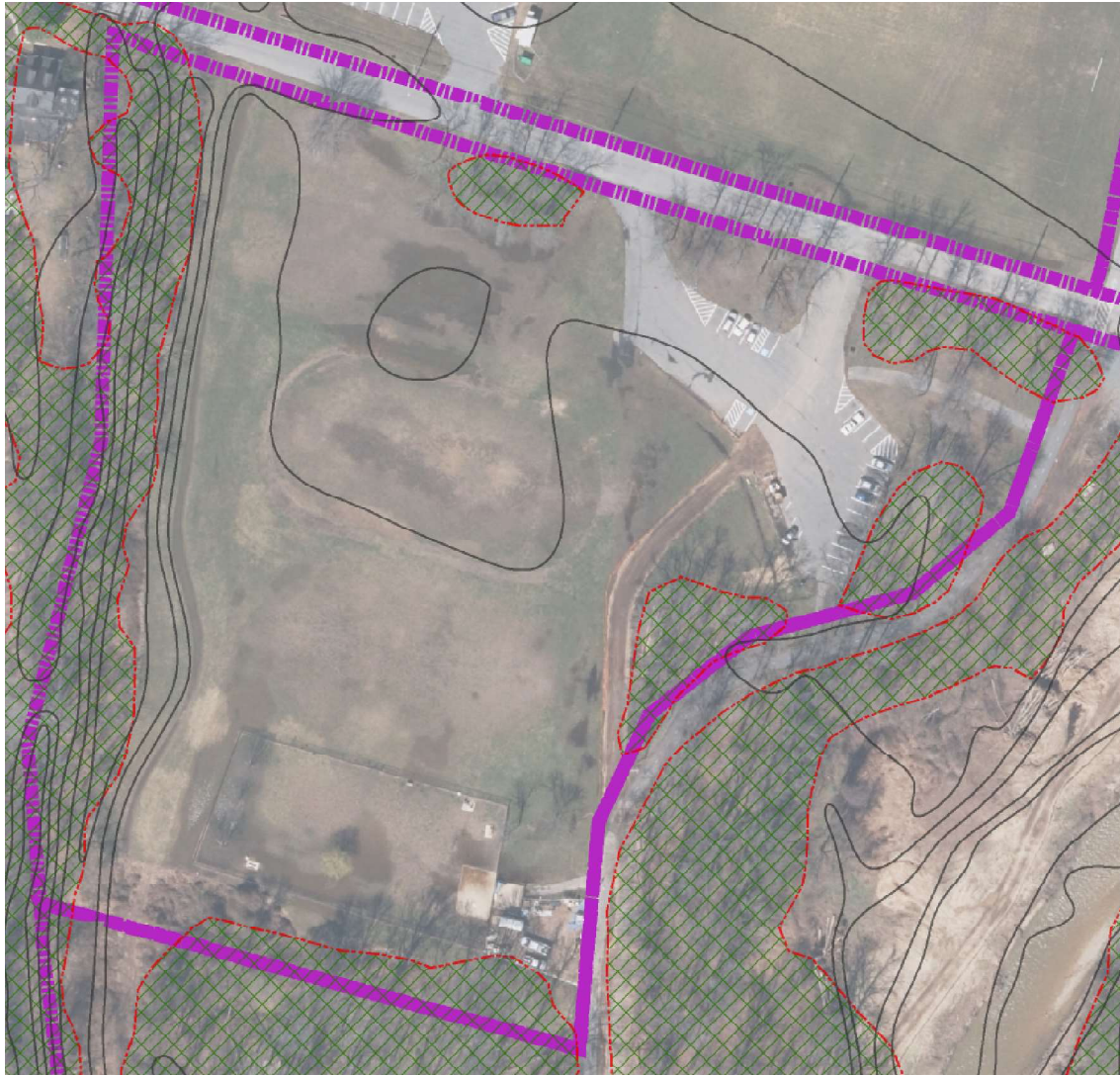
- Creating a pavillion area
- Building pollinator gardens around the site
- Planting more trees to help cool the site down
- Creating planting beds to define the recreational areas



# South Acredale Park



Recreational areas ground erosion



Water pools near parking



Mowing pattern



Grass in poor condition



Fenced dog park area



Running trail



Invasive plants



Stream restoration



# South Acredale Park



## Design Goals:

- 1. Reestablish canopy along the riverside to stabilize bank and improve animal habitat in riparian corridor
- 2. Use plantings to catch stormwater and encourage infiltration
- 3. Enhance the atmosphere of the park by providing shade and some screening from road noise
- 4. Suppress invasive species by replacing them with ecologically productive natives

## Planting List:

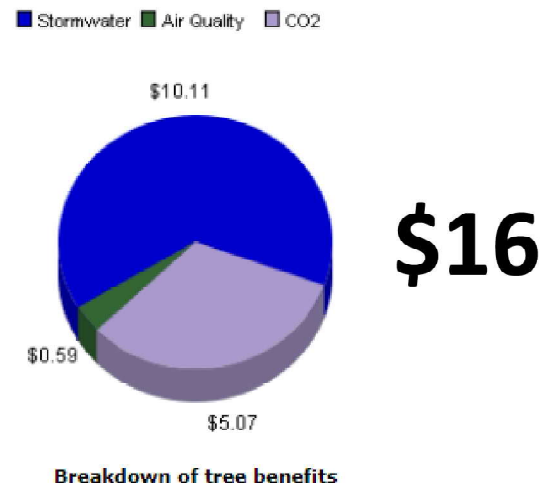
Large Trees	10	Acer rubrum	Red maple
	10	Betula nigra	River birch
	5	Fagus grandifolia	Amrican Beech
	10	Platanus occidentalis	American sycamore
	10	Quecus phellos	Willow oak
Small Tree	3	Cornus florida	Dogwood
	2	Diospyrous virginiana	Persimon
	50		



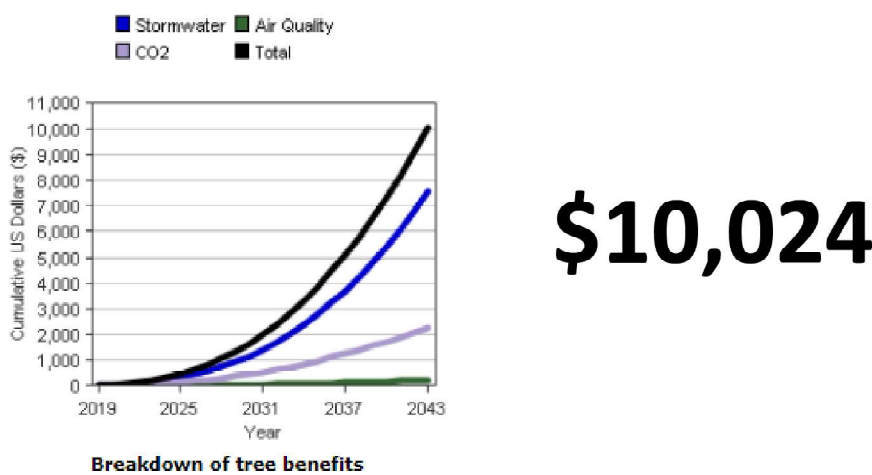
# South Acredale Park

## Recent Plantings: Three (3) Trees

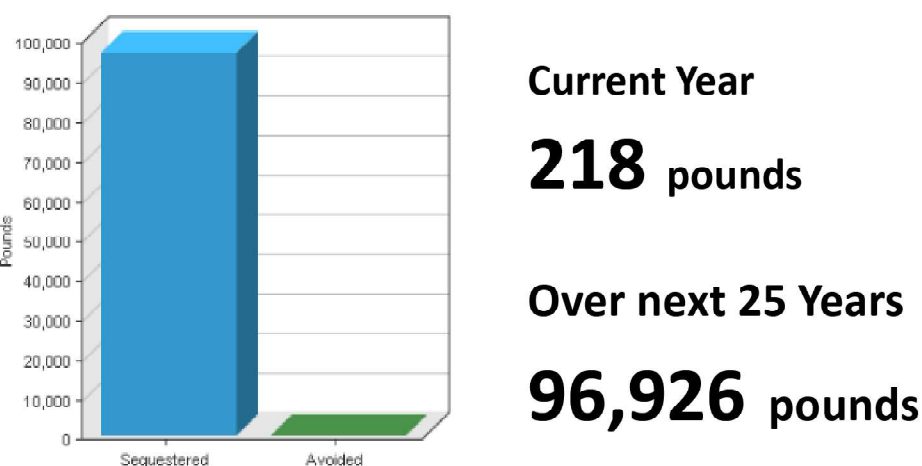
Current Year: Overall Benefits



Over the next 25 Years: Overall Benefits

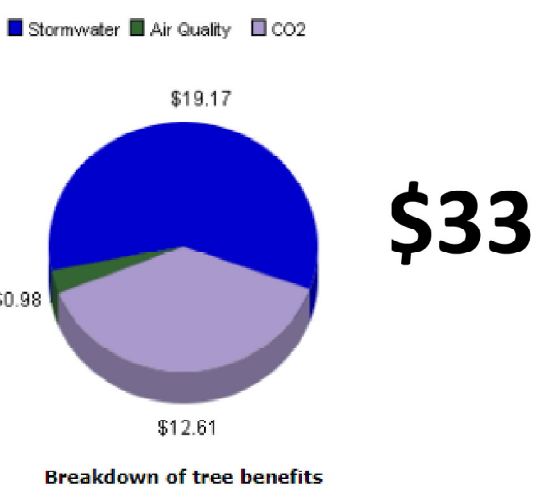


Sequestered Carbon

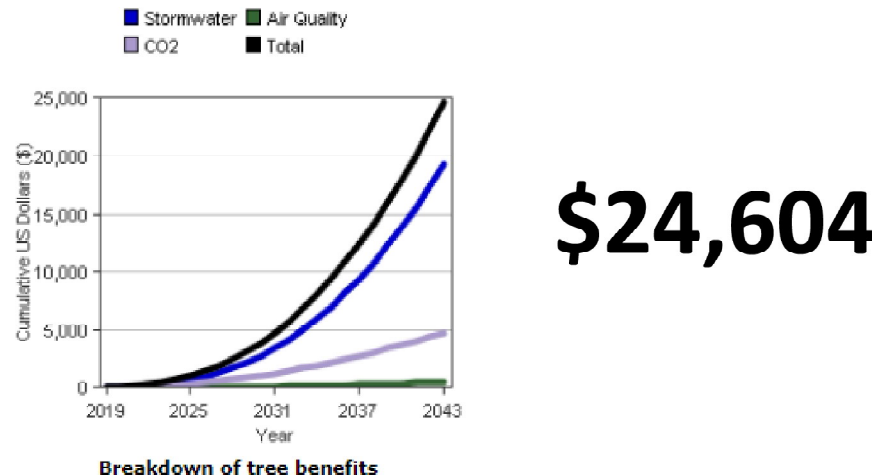


## Proposed Planting: Forty-three (43) Trees

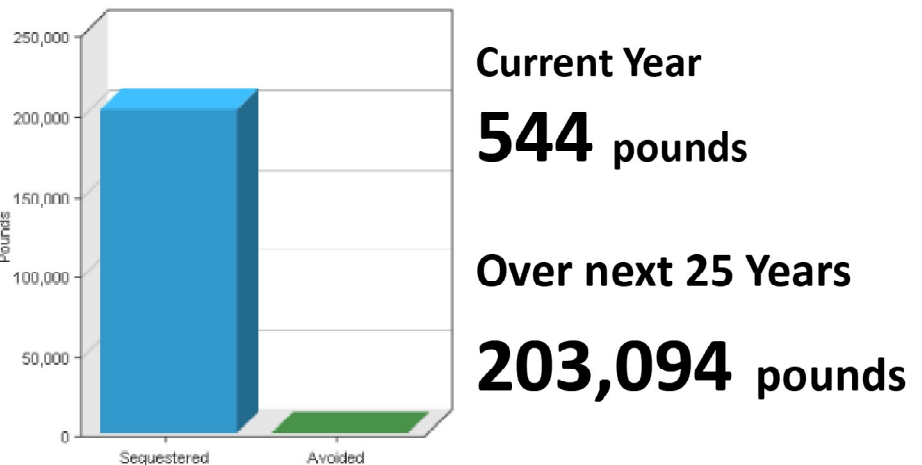
Current Year: Overall Benefits



Over the next 25 Years: Overall Benefits



Sequestered Carbon



# College Park Community Center

College Park Community Center



# College Park Community Center



0 100 200 400 feet

## Legend

- 2 Foot Contours
- 2017 Tree Canopy
- Park Boundary

## Site Inventory:

- Invasive plants located along the forest edges
- A public trail, Paint Branch trail, is located on the site
- There are only two street trees
- Landscaping exists in front of the community center
- An elementary school garden is located along the eastern entrance
- There are few, unhealthy trees located in the parking lot
- Water drains to the south and creates an unintentional wetland
- The majority of the site is open land or pavement
- An elementary school sits to the east

## Areas Needing Improvement:

- Increase the number of shade trees around the property, such as around the soccer field, next to the bleachers, in the parking lot, and street trees under the utility lines
- Increase the ground cover around the site, such as wet tolerant plants around the site's drainage areas
- Control invasive plants around the forest edge/restoration area
- Add new trail signage in the northwest part of the site and add a connecting path to the southern trail entrance
- Collaborate with the elementary school on plantings and landscaping

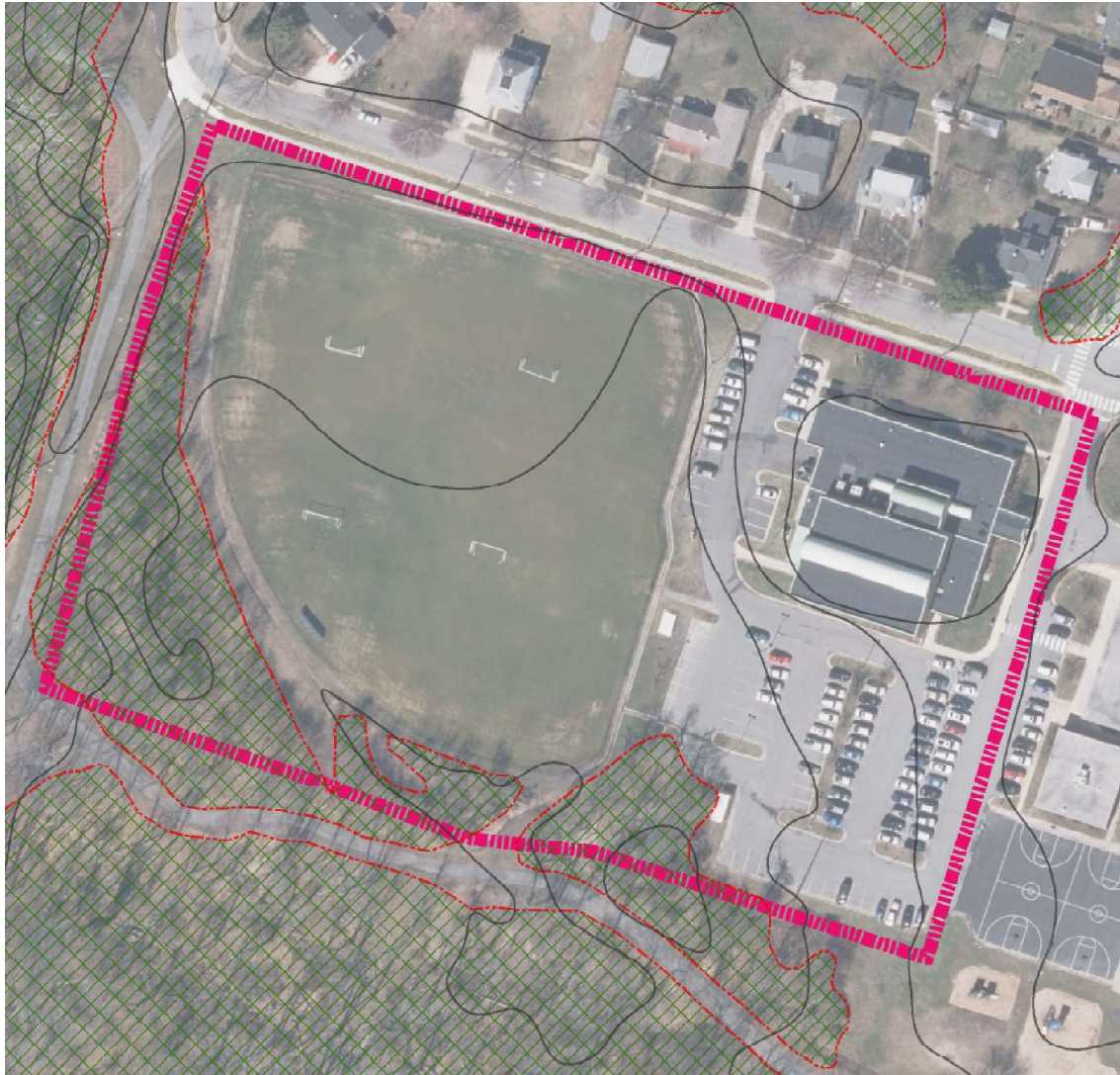




# College Park Community Center



Trail system close to site



Newly added rain garden to address drainage issues



Invasive plant control problems



Pollinator garden provides beauty and function



Drainage issues on site



Site is in neighborhood



View towards community center



No surviving trees in parking lot



# College Park Community Center



## Design Goals:

- 1. Vegetation
  - more shade trees
  - more ground cover
  - expand pollinator garden
  - beautify property
- 2. Connectivity
  - to Paint Branch Trail
  - with elementary school
  - with community
- 3. Maintenance
  - reduce open lawn
  - control invasive control
- 4. Water
  - intentional wetland
  - bioswales
  - rain garden

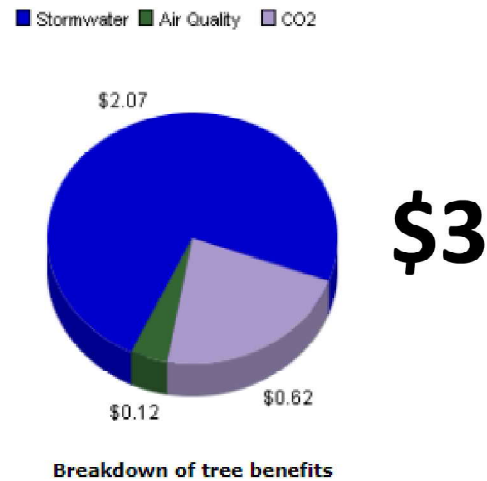
## Planting List:

Large Trees	9	Acer rubrum	Red maple
	4	Acersaccharinum	Silver maple
	5	Quecus alba	White oak
	9	Zelvova serrata	Zelkova
Small Tree	7	Cercis candensis	Redbud
	9	Cornus florida	Dogwood
43			

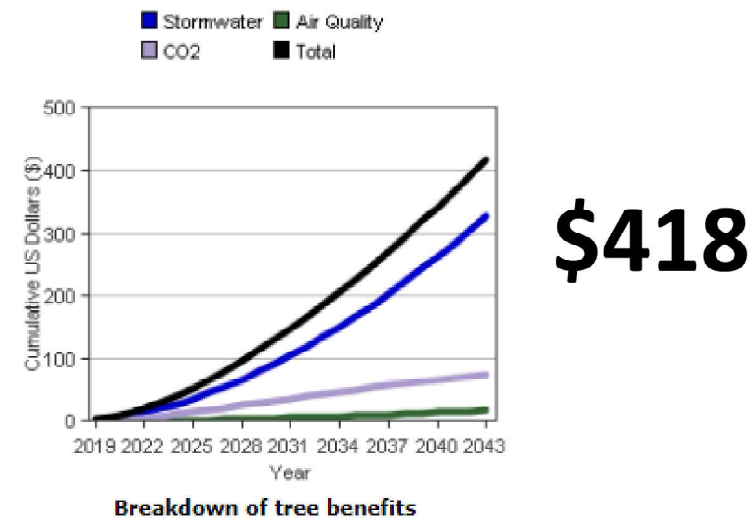
# College Park Community Center

## Recent Plantings: Three (3) Trees

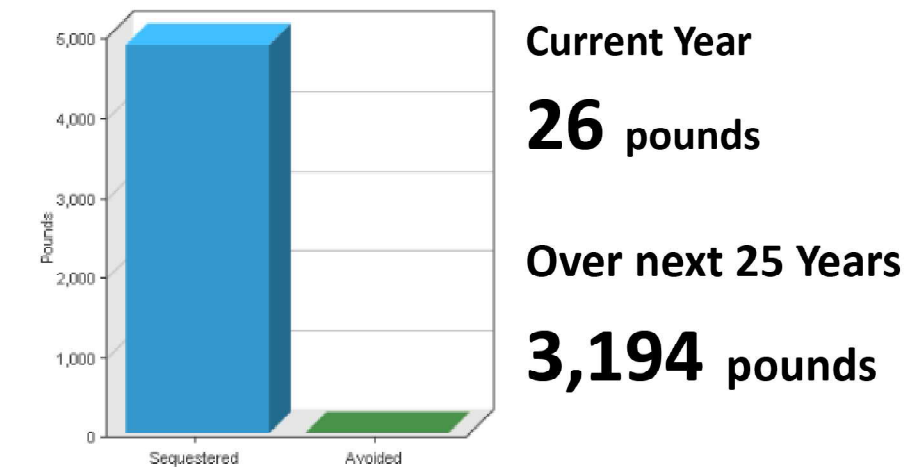
Current Year: Overall Benefits



Over the next 25 Years: Overall Benefits

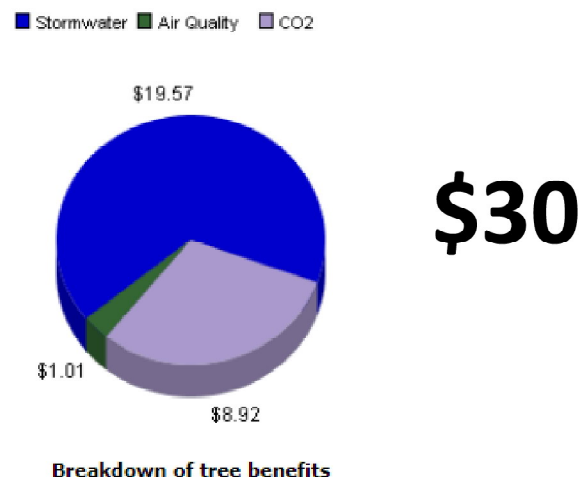


Sequestered Carbon

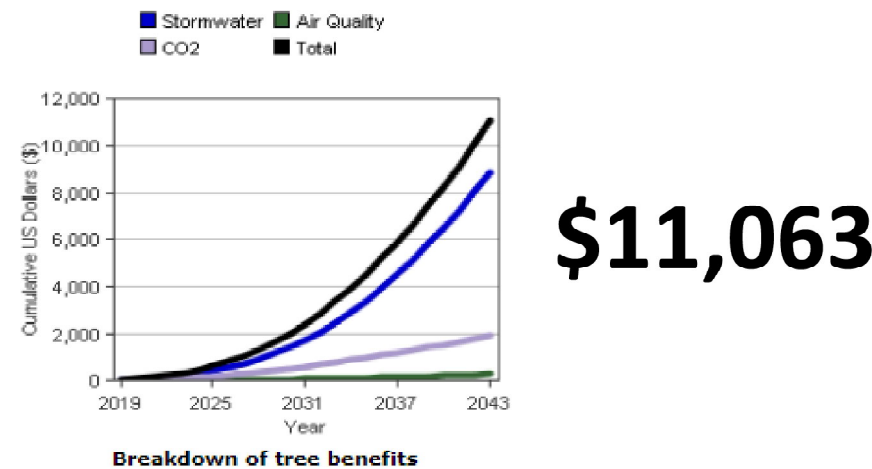


## Proposed Planting: Forty-three (43) Trees

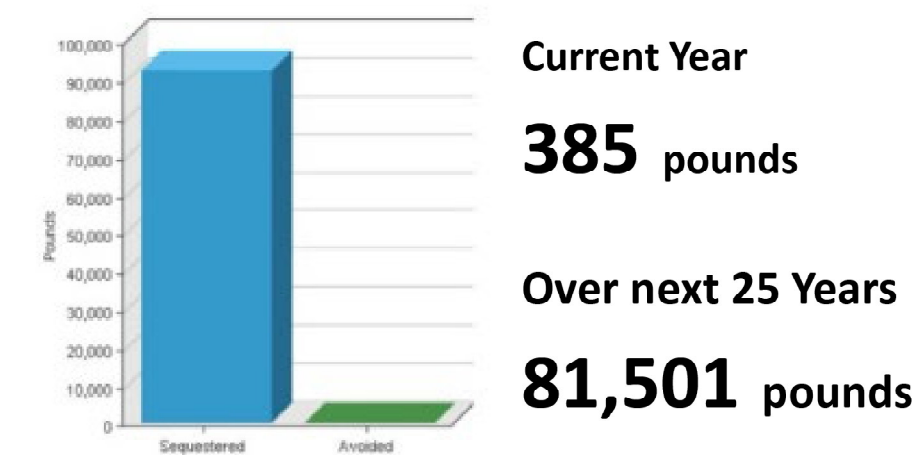
Current Year: Overall Benefits



Over the next 25 Years: Overall Benefits



Sequestered Carbon





# Butterfly Area: Lake Artemesia

# Butterfly Area: Lake Artemesia



0 100 200 400 feet

## Legend

- 2 Foot Contours
- ▨ 2017 Tree Canopy
- ▭ Park Boundary

## Vegetation Usage:

Vegetation on this site primarily acts as a buffer between the lake and the pedestrian trail and between the train tracks and pedestrian trail. The buffer area is also a Monarch butterfly waystation that is heavily planted, but has many dormant plants in the fall and winter.

## Areas Needing Improvement:

North of the Monarch waystation is a piece of open land with bird boxes. This area could be planted with canopy trees. The Monarch waystation is struggling against invasive plants and needs rejuvenation.

## Invasive Species:

Honeysuckle, Japanese Barberry, Multiflora Rose, Bradford Pear

## Available Amenities:

Beaches, Bathrooms, Gazebos, Lake, Trail, Fishing Deck

## How Vegetation Creates a Good Experience:

Park planting is essential to a good park experience. It adds beauty and creates a relaxing environment for a variety of activities, including jogging, biking, fishing, and yoga.



# Butterfly Area: Lake Artemesia



Southeast butterfly garden



North field



Bird sighting



North field



South field



South field



Bench mid-site by trail



South field water access



# Butterfly Area: Lake Artemesia



### Design Goals:

- 1. Remove invasive plants
- 2. Plant trees to fill in gaps in forest canopy
- 3. Increase pollinator plant diversity by spreading seed mix
- 4. Reduce the amount of lawn by planting more trees and planting pollinator mix to create meadow
- 5. Strengthen water edge by planting flood tolerant trees
- 6. Remove invasive plants along Metro track and plant native trees
- 7. Create more informational and general signs about the butterfly garden
- 8. Create a path that goes through the habitat garden

### Planting List:

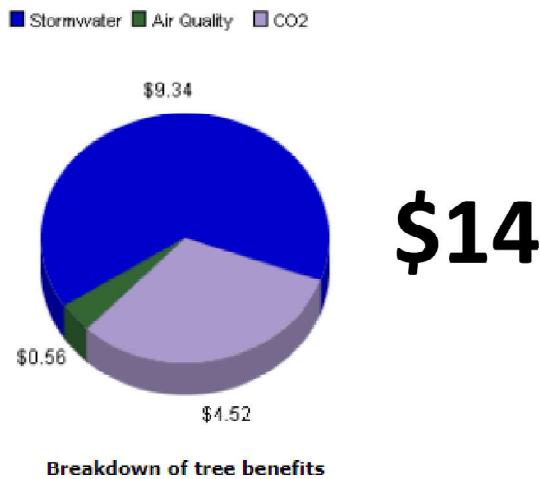
Large Trees	5	Betula nigra	River birch
	9	Cladastrus kentukea	American Yellowwood
	8	Celtis occidentalis	Hackberry
	21	Gleditsia tricanthos	Honey Locust
	6	Liquidambar styraciflua	Sweetgum
	7	Tilia americana	American Linden
Small Tree	6	Cercis candensis	Redbud
	62		



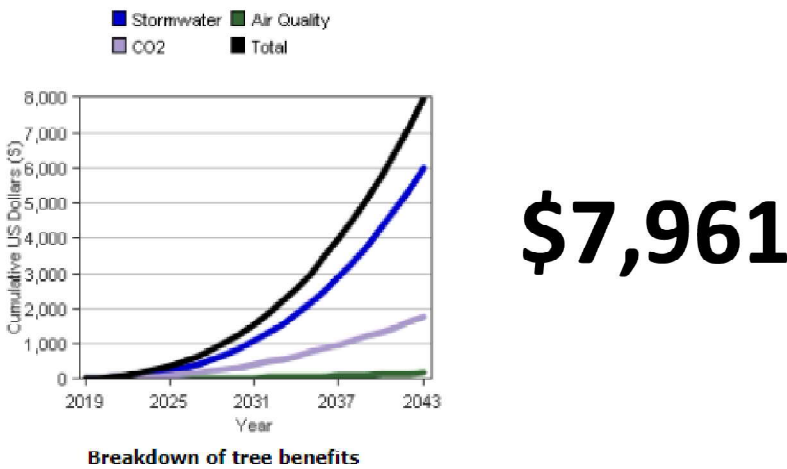
# Butterfly Area: Lake Artemesia

## Recent Plantings: Three (3) Trees

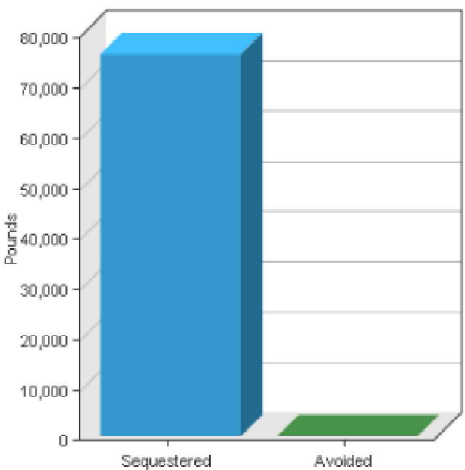
Current Year: Overall Benefits



Over the next 25 Years: Overall Benefits



Sequestered Carbon

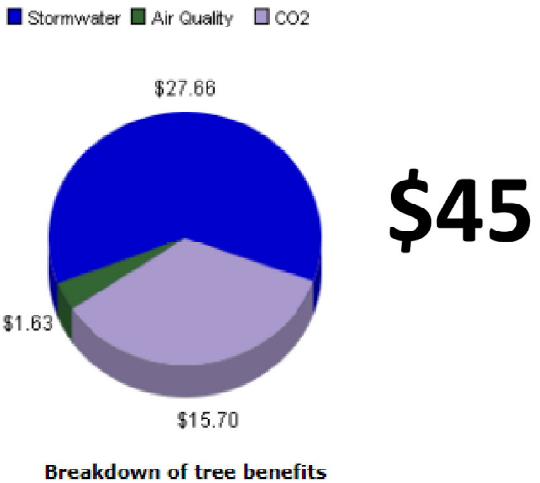


Current Year  
**195** pounds

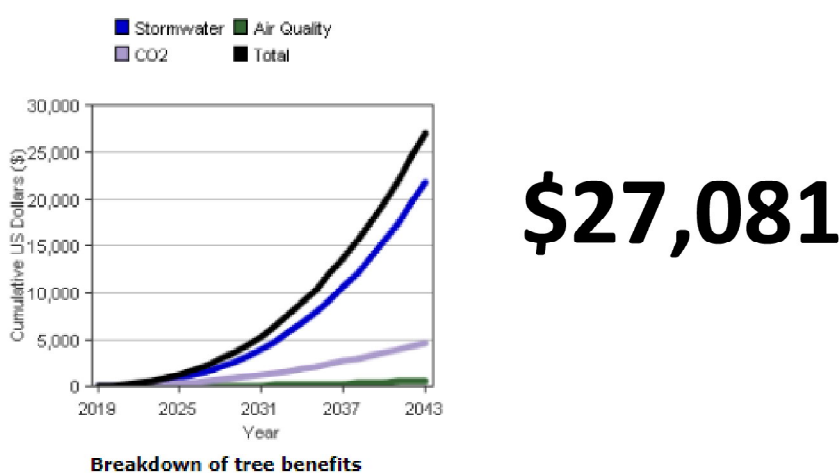
Over next 25 Years  
**76,170** pounds

## Proposed Planting: Forty-three (43) Trees

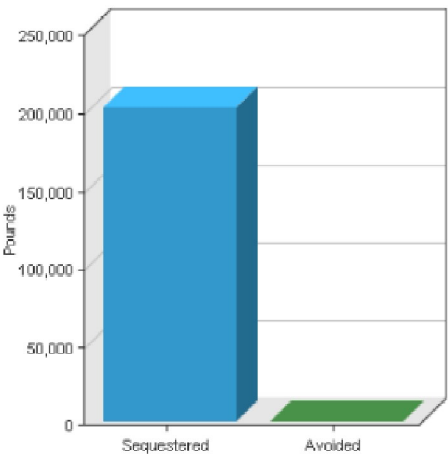
Current Year: Overall Benefits



Over the next 25 Years: Overall Benefits



Sequestered Carbon



Current Year  
**674** pounds

Over next 25 Years  
**201,694** pounds



# Reflections & Recommendations

As part of the presentation to Prince George's Parks and Recreation, the students were asked to reflect on and provide their recommendations about the overall projects. The word cloud suggests these ideas.

- Tree maintenance plans and tracking data are very important, maybe more important than actual planting.
- There are a wide array of projects that are run very differently. There are lots of different ideas to look at in terms of program organization, funding, tree maintenance, and community engagement.
- Tree planting efforts vary from project and organization. The benefit of community involvement is educating youth and how it can help in the success of the tree plantings.
- The amount of organization varies. I also enjoyed learning about these tree planting groups.
- Tree planting efforts can save a lot of money but can also cost a lot of money due to maintenance or failures.
- They are beneficial and vary from county to county. They also vary based on whether they are nonprofit or institutionally operated.
- Tree planting is important. Maintenance is also important to keep things functioning.
- Planting efforts take a lot of effort but are worth it for ecosystem services
- The most important factor for success is proper maintenance following planting efforts
- Setting realistic targets in planting trees and being specific about who will be ensuring maintenance
- Programs vary a lot in their formal organization; a large part of their mission is to sell the importance of trees
- They are a great way of encouraging community involvement while improving conditions within a community such as air quality, visual appearance and ecosystem services
- There are many programs and organizations today - getting engaged is key celebrating small successes and efforts as well holistically tree planting and preservation is crucial for
- Maximize quality forest to create value-added landscapes
- Trees are great and maintenance is as important as planting
- Trees take a while to see the benefits but are needed



# Appendix & References

## Assumptions

### Recent Plantings

The following tree schedules represent the assumed number of plantings of the four selected parks. One inch caliper was assumed for all planted trees for the I-Tree analysis. Where tree counts were missing, it was assumed that the species received the average number of trees from where information was available. In addition, to be conservative, we assumed approximately a 60% percent survival rate. The actual survival rate may be higher or lower and was not available.

### Proposed Plantings

The actual number and location of proposed trees was not re-verified in the field and the planting designs are conceptual and not construction documents. Due to site conditions, tree spacing, tree availability, and other factors, the actual number that could be planted would vary from the planting proposals. The exercise, however, does suggest the availability of plantable space where additional trees could contribute to additional carbon sequestration and well as as an increase in monetary benefits.

## References

### i-Tree Design

<https://design.itreetools.org/>

North Acredale	Actual or Assumed Number	60% Survival	Botanical name	Common Name	Caliper
Large Trees	3	2	Betula nigra	River birch	1
	3	2	Platanus acerfolium	Sycamore	1
	3	2	Quercus alba	White oak	1
	3	2	Aesculus flava	Buckeye	1
	3	2	Pinus rigida	Pitch pine	1
	3	2	Prunus serotina	Black cherry	1
	18	12			
		60%			
South Acredale	Actual or Assumed Number	60% Survival	Botanical name	Common Name	Caliper
Large Trees	10	6	Betula nigra	River birch	1
	4	3	Nyssa sylvatica	Black gum	1
	5	3	Quercus palustris	Pin oak	1
	2	1	Quercus bicolor	Swamp white oak	1
Small Tree	2	1	Quercus alba	White oak	1
	1	0	Quercus phellos	Willow oak	1
	2	1	Liquidambar styraciflua	Sweetgum	1
	3	1	Ilex opaca	American holly	1
	4	3	Quercus nigra	Water oak	1
	4	2	Cornus florida	Dogwood (Cornus florida)	1
	1	1	Cercis canadensis	Eastern redbud	1
	38	22			
		60%			
Community Center	Actual or Assumed Number	60% Survival	Botanical name	Common Name	Caliper
	3	2	Cornus alba	White dogwood	1
	2	1	Amelanchier sp	Serviceberry	1
	5	3			
		60%			
Lake Artemesia	Actual or Assumed Number	60% Survival	Botanical name	Common Name	Caliper
Large Trees	3	2	Betula nigra	River birch	1
	3	2	Nyssa sylvatica	Black gum	1
	3	2	Quercus rubra	Northern red oak	1
	3	2	Quercus palustris	Pin oak	1
	3	2	Quercus bicolor	Swamp white oak	1
	3	2	Quercus alba	White oak	1
	3	2	Quercus nigra	Water oak	1
	3	2	Liquidambar styraciflua	Sweetgum	1
	3	2	Ilex opaca	American holly	1
Small Tree	3	2	Cercis canadensis	Eastern redbud	1
	3	2	Cornus florida	Dogwood	1
	3	0	Amelanchier arborea	Serviceberry	1
	36	22			
	5	61%			

